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Sand and Gravel Production at the Hoover Dam

Unusual Methods Used by the Six Companies, Inc., to Overcome Difficult Conditions in the Handling of Aggregates for This Work

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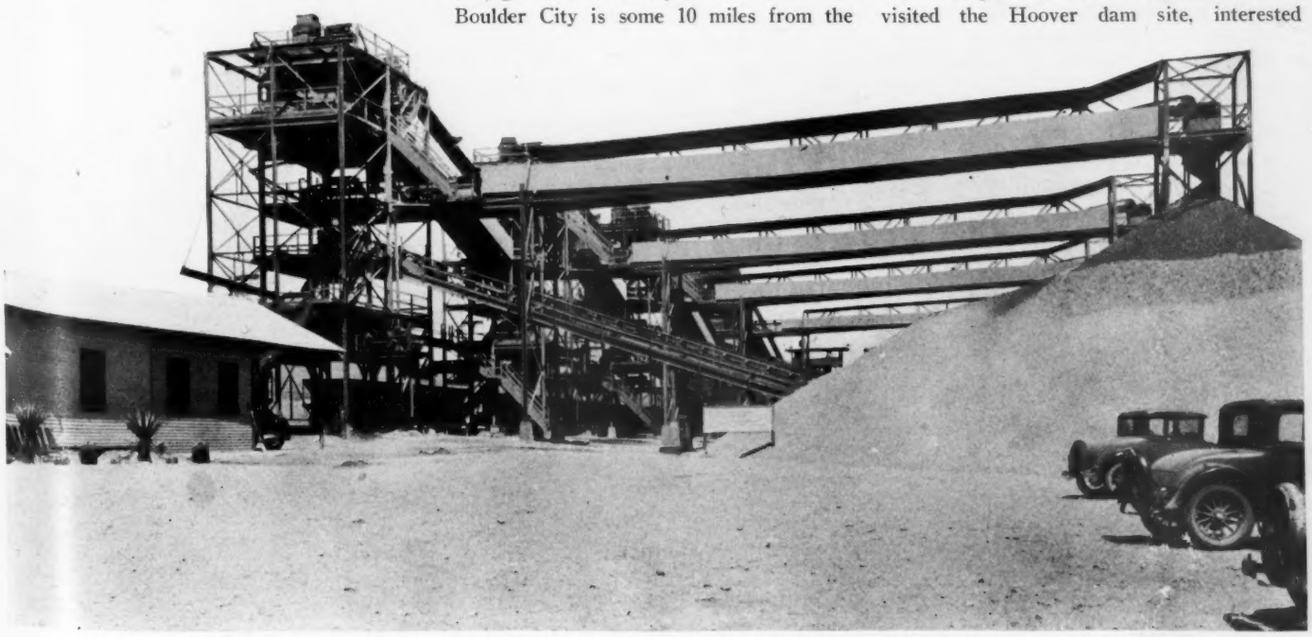
THE HOOVER DAM is one of the outstanding construction projects of the age and one of the most daring from an engineering standpoint. Not only is it a huge project but one that calls for the highest engineering skill. Actual construction work, now in its second year, is being pushed with more than expected speed.

Every phase of the work necessary to the carrying through of the project has been done in such a manner as to arouse favorable comment from those familiar with construction jobs. There is none of the usual haphazard work done on what might be called secondary phases of the job. Usually construction work, temporary work by its very nature, means camp conditions. On many jobs little thought is given and less money spent on living conditions, water supply, streets, street lighting, etc.

On this job, however, everything of that nature was planned in advance and we find at Boulder City a model city constructed by Six Companies Inc., builders of the Hoover dam. It has well-lighted paved streets, homes of artistic design for the staff and homes for the married workmen that are exceptionally well built and provided with water, gas and electricity.

Boulder City is some 10 miles from the scene of the actual construction work and about 7 miles from the remarkable sand and gravel plant that has been erected to supply the millions of yards of aggregate necessary for the dam construction. Men are hauled to and from the various places of work in army type transport trucks. The city, located on a divide 2000 ft. above the river, and the dam site are served by a stub line connecting with the Union Pacific system near Las Vegas, Nev. It is located so that if there is any breeze blowing living conditions during the intense summer heat are better than for ordinary desert life.

For the past three summers the writer has visited the Hoover dam site, interested



General view of the sand and gravel washing and sizing plant

Looking upstream a short distance below the lower end of the diversion tunnels

have been driven, two on the Arizona side and two on the Nevada side. These tunnels are now being lined with 3-ft. concrete walls and will have an inside finished diameter of 50 ft. A total of 400,000 cu. yd. of material will be used in these concrete linings.

When the tunnels are completed, which is expected to be in December of this year, waters of the Colorado river will be diverted into them by an up-stream cofferdam, thus clearing the river bed of water at the dam site. Below the site a second cofferdam will be constructed to prevent back drainage. The cofferdams will be of dirt and rock construction, with the up-stream face of the upper cofferdam blanketed with concrete and the down-stream face of rubble. They will be roughly 500 ft. thick at the base and will be similar in construction to modern earth-fill dams.

When the dam is about half completed or brought to a point about 430 ft. above the expected foundation line and some of the power units installed, the water storage will be started. The Colorado river is comparatively flat, the fall being approximately 5 ft. to the mile. The gravel pit, which is located 11 miles above the dam site, will be flooded by a very small raise in the elevation of the river, as also will be the low level concrete

mainly in the sources of aggregate that would be used for the dam. During the preliminary stages of this work the United States Bureau of Reclamation established a testing laboratory at Las Vegas, Nev., and conducted tests on the various aggregates submitted.

The adjacent desert country is every inch a potential source of aggregates, either sand and gravel or crushed stone, but scarcity of water, extremely rugged semi-mountainous conditions and the presence of variable amounts of silt and inferior particles in the aggregates, made the problem no easy one. Transportation, however, is without question the outstanding problem of aggregate production at the Hoover dam.

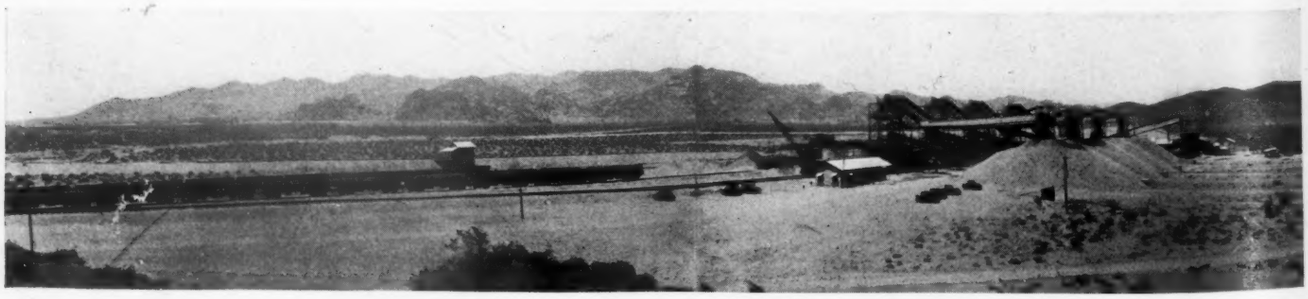
The problem of delivering aggregates first to the lower parts and then later to the higher parts of the concrete work; the problem of delivering the aggregates to the washing plant and from the washing plant to the huge stockpiles, which will eventually contain 7,000,000 tons of aggregate, in five sizes; the problem of reclaiming this vast yardage of concrete making material, all this transportation having to be carried on at a rate of at least 1000 yd. per hour is the picture that is now developed at the dam site.

In order that the reader may grasp the whole problem of aggregate production and its transportation, an outline of the work may not be out of place.

The Hoover dam will be 730 ft. high, 45 ft. wide at the crest and 650 ft. wide or thick at the base. This will call for 3,400,000 cu. yd. of concrete. Four diversion tunnels, each 56 ft. in diameter and 4000 ft. long,

Designers and builders of plant

Left to right: Mario; L. Eck; Higgins; Taylor; Wilde; Gunnel; Price; Allen; Dodge; H. Eck; Lane; Walker; Russell



Another view of sand and gravel plant, showing nature of surrounding country

mixing plant, but it is estimated that it will take four or five months for the reservoir to fill to the level of the gravel plant at grade 1000.

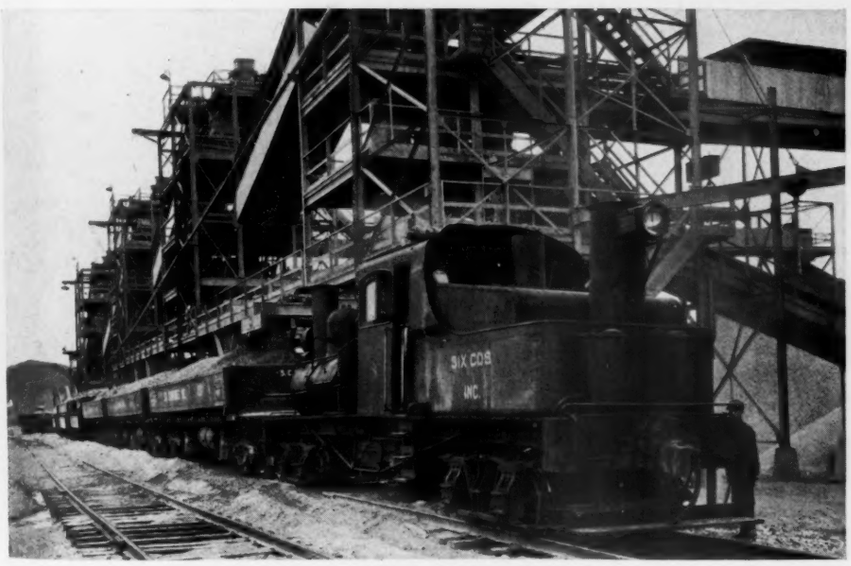
The gravel screening plant, however, will be located above this intermediate high-water mark. While the storage piles of finished aggregate are now being made above the eventual high-water mark, the bulk of the aggregate being produced from the pit is being stored in raw form at the screening plant. Production from the pit cannot proceed as water storage begins, but the gravel screening plant is expected to remain in operation for some time after water storage begins. It will eventually be completely submerged.

Referring to the accompanying map it may be seen that the sand and gravel plant and the ready-mixed concrete plant are above the dam site and that when water is diverted into the dam these working units would be submerged. This is the reason for the huge stockpile of some 7,000,000 tons of aggregates. When the present site is under water pouring of concrete for the upper half of the dam will be continued from the stockpiles. Similarly the ready-mixed plant which now has four 4-yd. Smith mixers will be augmented to include six and at the same time moved to a higher elevation so as to expedite the work of pouring the top parts of the dam.

To stockpile such a huge amount of material and reclaim it after a lapse of considerable time may mean the erection of a second screening plant so that the material may be rinsed before use as the infiltration of sand and silt from the desert winds is considerable.

The specifications for aggregates as laid down by the Bureau of Reclamation are very strict and inspections are frequent and severe.

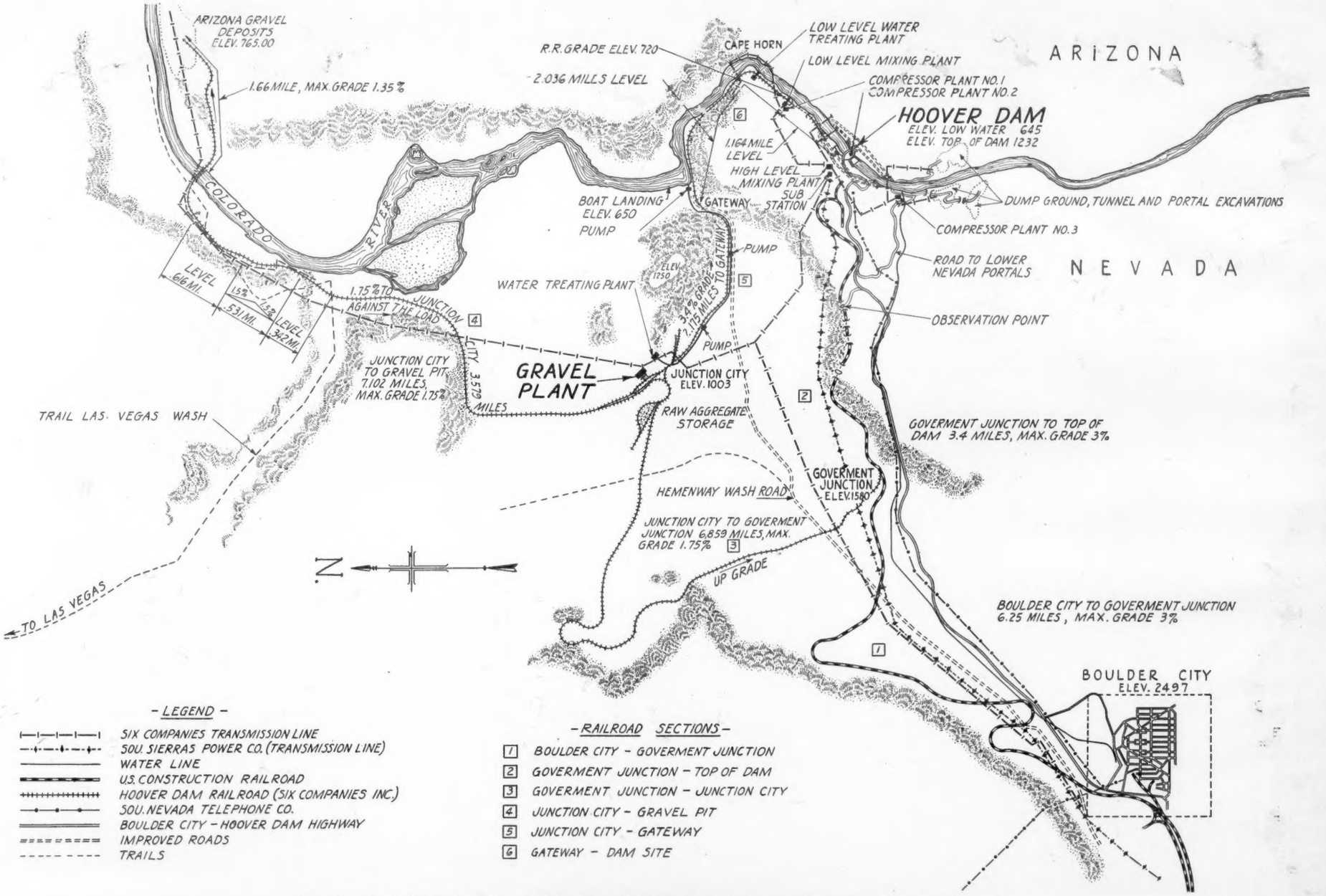
Electric dragline used for excavating at the pit



Loading side of plant

Sand for concrete must not have over 0.2% silt and until early in May the specifications called for 0.1% or less of silt. Even where clear water is plentiful it is hard enough to meet such a specification, but at this plant the waters of the Colorado river before clarifying contain from 30,000 to 50,000 parts of silt per million. The water is pumped two miles in three stages using specially designed Byron Jackson centrifugal pumps, designed to handle muddy water. The 6-in. single-stage pumps are so located that as the water in the dam rises the lower set of pumps can be removed, thus eliminating one stage of the lift. At each station two pumps were installed in parallel (one as a spare), discharging through a 12-in. line. They deliver river water to the clarifying plant, which reduces the silt content to less than 500 parts per million. This is done in a 120-ft. diam. Dorr thickener. Water from the thickener is also passed through two batteries of International fil-

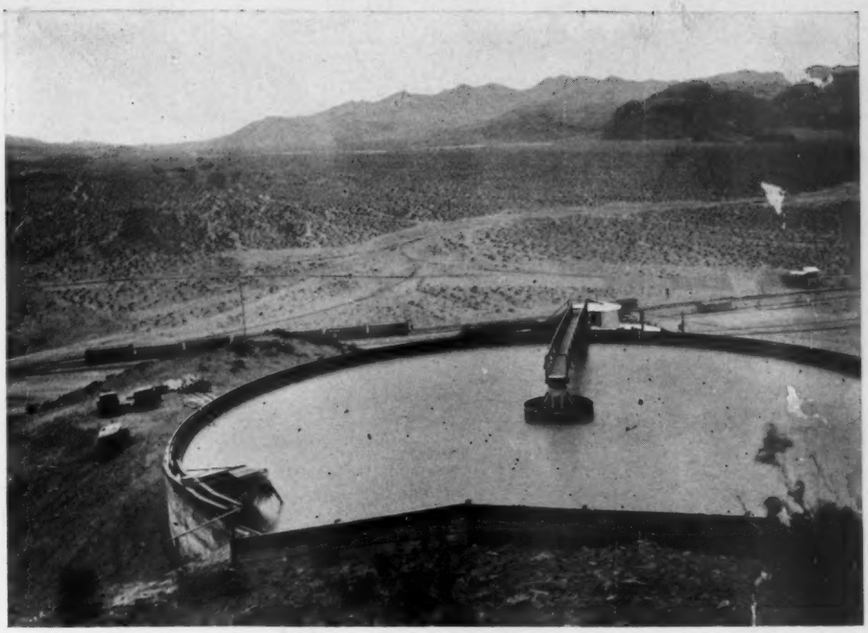
Some of the equipment used



Map showing relative locations of the Hoover Dam, sand and gravel plant and gravel deposits

ters, but this water is used for steam locomotives on the railroad. A similar clarifying plant is used for preparing water for the ready-mixed concrete plant.

All water from the washing plant, including even the water drained from the stockpiles of sand, is drained through a tile drainage system and is collected at a sump and pumped back to the clear water line. The sand and gravel plant uses about 3000 gal. of water per min. and the clarifying plant handles considerable in excess of this figure. It is estimated that there is a 15% loss of water. As the clarifying plant is located on a hill some 110 ft. above the plant, the water from the sand and gravel operation is pumped back to the settling unit by a specially designed 12-in. centrifugal pump. Clear water is returned to the plant through a 16-in. line and a line of the same size serves the 12-in. pump discharge. Thus the problem of getting suitable water for washing the sand and gravel is no small one and would discourage many commercial producers.



120-ft. Dorr thickener used in clarifying the river water

The gravel pit from which the aggregates

The coarse aggregate, or "cobbles," runs from 3 to 9 in. in size

are being taken is located about 7 miles from the washing and screening plant and is alongside the Colorado river on the Arizona side. A wooden bridge for automobile and railroad use has been built across the river near the pit. Three trains of ten 30 cu. yd. Western standard-gage, side-dump cars are used to haul the gravel to the plant. The railroad line from the pit to the plant has an up-grade of about 1¼%. A large stockpile is being provided at the plant for the storage of the crude material which is reclaimed by means of a railroad type Brownhoist crane equipped with an Owens clamshell bucket.

The site chosen for securing the aggregates was carefully examined by a series of test pits before production started. The deposits is 15 to 35 ft. in depth, all of which is satisfactory aggregate except the top 2 ft. This top material contains an excessive amount of silt and hence is discarded.

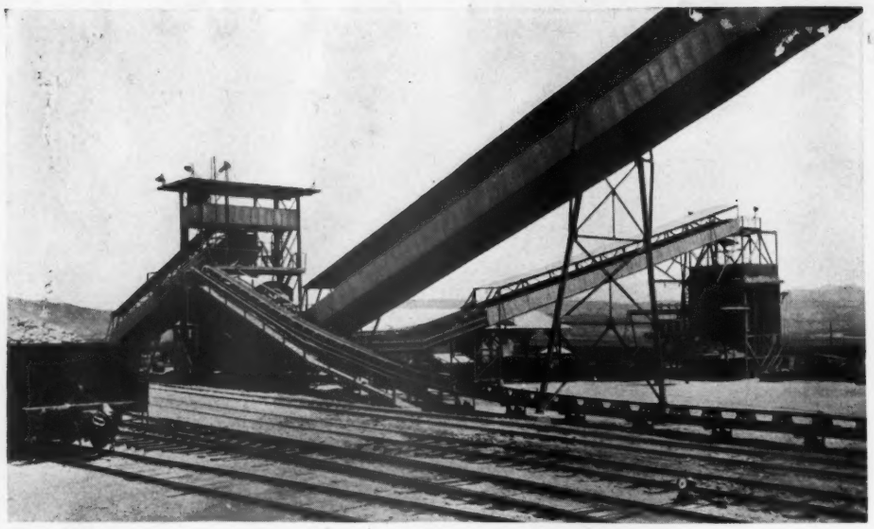
A 5-yd. Marion electric dragline excavator operating 24 hours per day is used for loading. The deposit is expected to yield the total material required. The dragline loads at the rate of 350 cu. yd. per hour, which is below the later concrete requirements, but is more than sufficient for the present work of lining the tunnels and permits sending excess material to the stockpiles. The trains hauling the gravel to the plant are powered by 150-ton, standard-gage steam locomotives, while a 30-ton Plymouth gasoline locomotive is available at the pit for miscellaneous uses.

The gravel in the pit contains no considerable amount of large boulders and is well graded as to variety of sizes. In commercial operations of a similar nature the deposit might be considered as containing an excess of oversize, but as gravel up to 9-in. diameter, so-called "cobbles," will be used in the dam, the deposit is quite satisfactory as to size of material. The gravel is for the most part a hard tough igneous material with a preponderance of dark to black rock.

The sand and gravel plant is located at what is known as Junction City, from which point washed sand and gravel can be dispatched by rail to the lower concrete mixing plant or to the future mixing plant on the higher rim of the canyon. Also the aggregates from this center can be routed to the rim of what is known as the Hemingway wash, where five huge stockpiles are now being built. When the dam is

A shuttle conveyor is used at each tower to load cars for delivery to the concrete mixing plant

Map showing relative locations of the Hoover Dam, sand and gravel plant and gravel deposits



Primary scalping screen at left and crusher at right

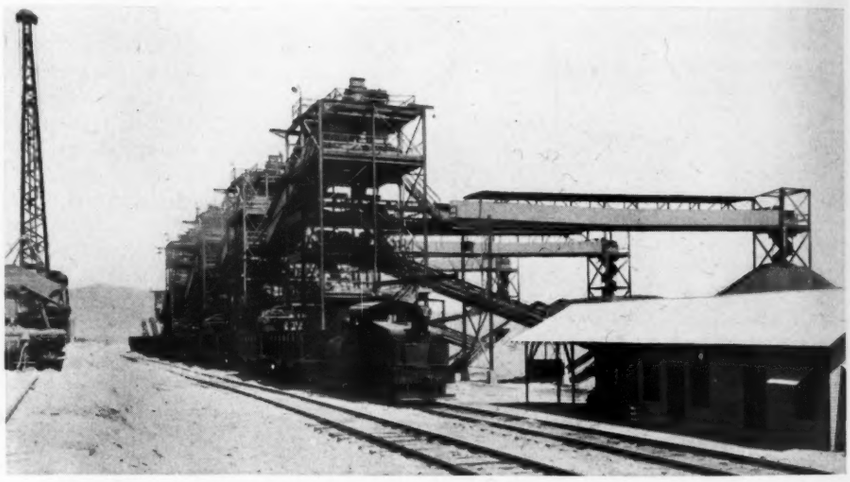
completed Hemingway wash will be a huge lake and Junction City will be, like the lost Atlantis, far below the surface of the lake.

In designing the plant three points were kept in mind: operation either wet or dry, double operation without interrupting operation and increased live storage without interrupting operation. Designed for a feed of 500 tons per hour, with the idea of increasing it later to 1000 tons per hour, it has recently been operated with a feed of 600 tons per hour. Flexibility, especially with reference to those three points, has been attained.

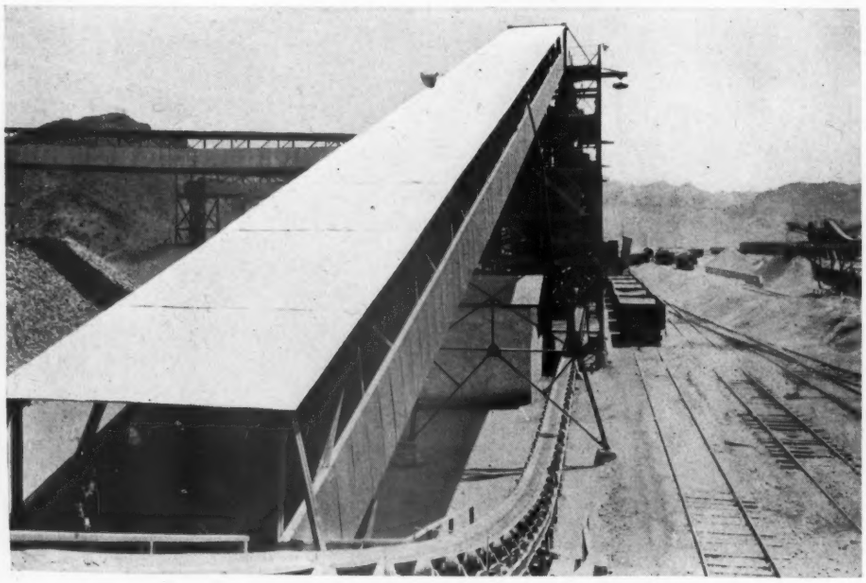
The general design and details of the plant are unusual, particularly for a construction project, in that the structures are of steel and concrete such as are found in only the best of permanent plants, and all equipment is of the highest grade. Timber construction was given consideration but abandoned in favor of steel, as the cost was little more and a life of five years or more in such a hot arid climate was certain to involve much maintenance with timber, due to shrinkage.

A rotary scalping screen is used for removal of the large oversize which is crushed in a 16-in. Allis-Chalmers Superior gyratory crusher and the crushed stone is returned to the circuit by a belt conveyor. The crushed and uncrushed gravels are not kept separate. In the second operation the cobbles are removed as oversize by vibrating screens, after which the sands are removed by a second battery of vibrating screens. The sand screens are operated dry, but water is introduced in the hoppers below and the sands flumed to the washers.

Five sizes of aggregates are prepared: cobbles (3- to 9-in. gravel), 1½-in. to 3-in., ¾-in. to 1½-in., ¼- to ¾-in. and sand. Each size, except the sand, is produced in a separate tower and the finished material is carried on an overhead belt conveyor to the plant storage pile. These four stockpiles are parallel to each other and the materials are reclaimed by tunnels below each pile. At present the piles are conical and have a live storage of about 2000 tons, but provisions have been made for extending the tunnels so that a much larger storage can be obtained. These storage piles must not be confused with the larger piles that are being started above the high water levels, but are simply plant storage piles for holding the daily production of gravel and are used more or less as surge storage piles.



Plant and office, with loading tracks in foreground

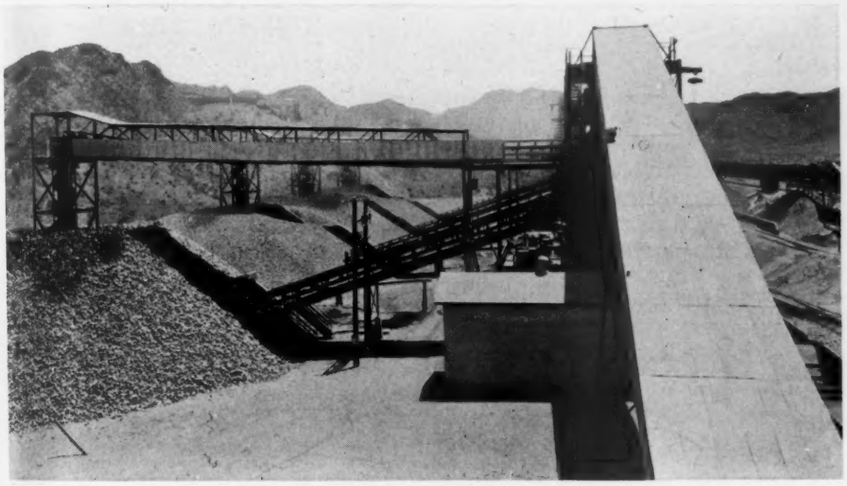


Looking toward plant from control tower above scalping screen house

The plant has been designed so that a second adjoining tower can be constructed at each screen unit and production increased without interfering with the present set up. Belt conveyors are used for conveying and elevating the materials. Many of these are now running at comparatively slow speeds, which will be increased when the capacity is increased, but a large number of new belt units will have to be supplied. All of the present belts were supplied by the Pioneer Rubber Co. of Pittsburgh, Calif. They are carried on Stearns roller bearing idlers which are Alemite lubricated and where the

CONVEYORS—HOOVER DAM SAND AND GRAVEL PLANT

	Width	Length, Present	Length, Future	Lift, ft., Present	Lift, ft., Future	Speed, f.p.m., Present	Speed, f.p.m., Future	Capacity, tons per hr., Present	Capacity, tons per hr., Future	Power, Present	Power, Future	Motor, Present	Motor, Future
Conveyor A	42-in.	254	254	52	52	200	400	500	1000	39	78	60	125
Conveyor B	30-in.	178	178	33	33	200	200	200	200	10	10	15	15
Conveyor C	24-in.	160	.....	23	....	200	.....	200	.....	5	....	7½	.....
Conveyor E	36-in.	209	209	65	65	300	300	600	600	50	50	75	75
Conveyor F	30-in.	134	380	4	4	150	300	175	350	3	12	10	20
Conveyor F-1	30-in.	134	380	4	4	150	300	175	350	3	12	10	20
Conveyor F-2	24-in.	134	380	4	4	175	350	150	300	3	11	10	20
Conveyor F-3	24-in.	134	380	4	4	175	350	150	300	3	11	10	20
Conveyor G	30-in.	158	430	43	50	300	300	400	400	30	34	50	50
Conveyor G-1	30-in.	158	430	43	50	300	300	400	400	30	34	50	50
Conveyor G-2	30-in.	158	430	43	50	300	300	400	400	30	34	50	50
Conveyor G-3	30-in.	158	430	43	50	300	300	400	400	30	34	50	50
Conveyor H	30-in.	113	113	35	35	300	300	400	400	18	18	25	25
Conveyor I	24-in.	90	90	28	28	350	350	300	300	10	10	15	15
Conveyor J	24-in.	90	90	28	28	200	200	150	150	6	6	10	10
Conveyor K	24-in.	383	383	18	18	200	200	100	100	5	5	10	10
Conveyor L	48-in.	20	20	0	0	120	120	400	400	3	3	5	5
Conveyor L-1	48-in.	20	20	0	0	120	120	400	400	3	3	5	5
Conveyor L-2	48-in.	20	20	0	0	120	120	400	400	3	3	5	5
Conveyor M	24-in.	122	122	15	15	200	400	225	450	5	8	7½	15
Conveyor N	24-in.	186	336	30	30	225	450	225	450	13	34	25	50
Conveyor O	24-in.	15	15	5	5	450	450	225	450	2	3	10	10
Conveyor O-1	24-in.	15	15	5	5	450	450	225	450	2	3		



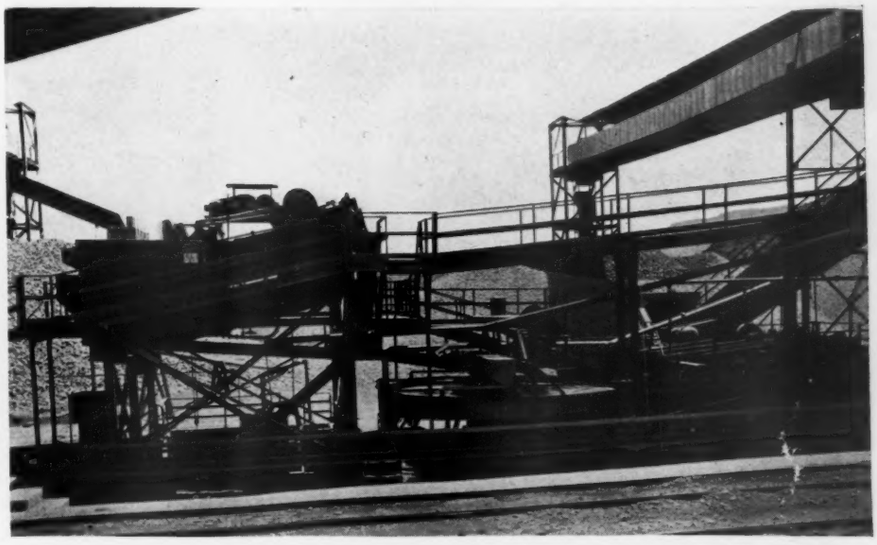
View showing piling and reclaiming conveyors used at each tower

belt is subjected to impact, rubber covered idlers have been provided. Conveyor pulleys, shafting and bearings were supplied by Link-Belt Co. and herringbone gear reducers by the Falk Corp.

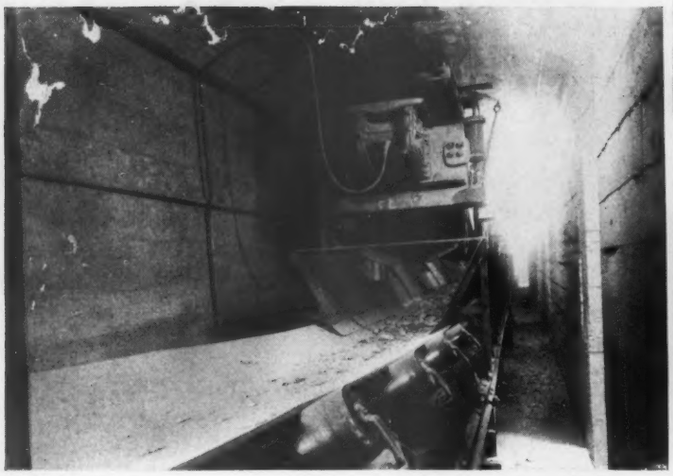
The accompanying table gives the essential data on the conveyors, both for the present set up and for the later enlarged program.

The material from the pit is delivered to a long track hopper over which there is a rail grating with 12-in. openings. There are very few boulders of large oversize. Below the track hopper and in a continuous row are nine Traylor electric vibrating feeders which feed the sand and gravel to the main belt. The feeders are of extremely heavy rugged construction and are quite unusual in sand and gravel operations. Their first cost is about equal to the more conventional types of feeders, but they have the advantage of compactness (valuable when installed in an expensive tunnel) and adaptability for starting and stopping, as well as control of rate of feeding from a remote station. Similar feeders are used over the reclaiming belts handling the larger sizes of aggregates.

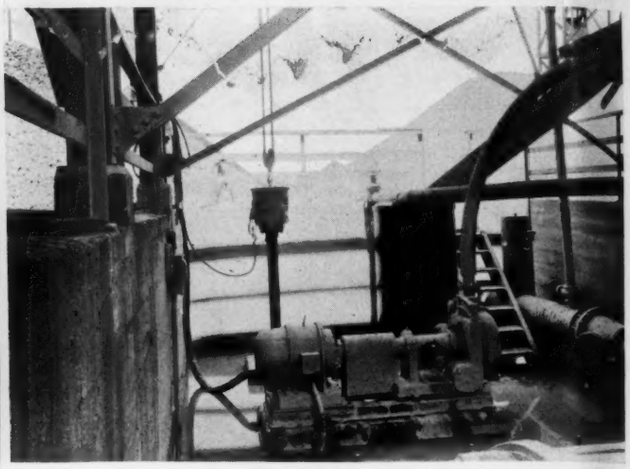
Conveyor A discharges to a 60-in. by 16-ft. rotary screen, furnished by the Bodinson Manufacturing Co., which is equipped with perforated steel plates having 8-in. square openings. The throughs fall to belt E, 36-in. wide, which delivers the material to the first set of vibrating screens. The oversize falls to Conveyor B, 30 in. wide, which delivers the boulders to a 250 ton wooden bin adjacent to the 16-in. gyratory crusher. The crusher is fed by means of a reciprocating pan feeder augmented by finger gates for use in emergency and is set to deliver a 3-in. product. This falls to a 24-in. belt (C), which returns the crushed stone to belt conveyor E. Belt A is of 9-ply heavy construction, with 32 oz. duck and 3/16-in. rubber cover. Some of the other belts are of 28-oz. duck and have ⅛-in. to 3/16-in. rubber covers. Belt E (36 in.) elevates the material from the trommel to a battery of two 4 ft. by 10 ft. vibrating screens. One of these is a Symons double-deck rocker type screen and the other is a single-deck Robins Gyrex screen. The former has 4-in. mesh wire cloth on the upper deck and 3-in. mesh on the lower deck. The Gyrex screen has 3-in. mesh wire cloth. The oversize or cobbles from these screens is chuted to a hori-



Rake classifier, upper left, and bowl classifier, below, in which sand is produced



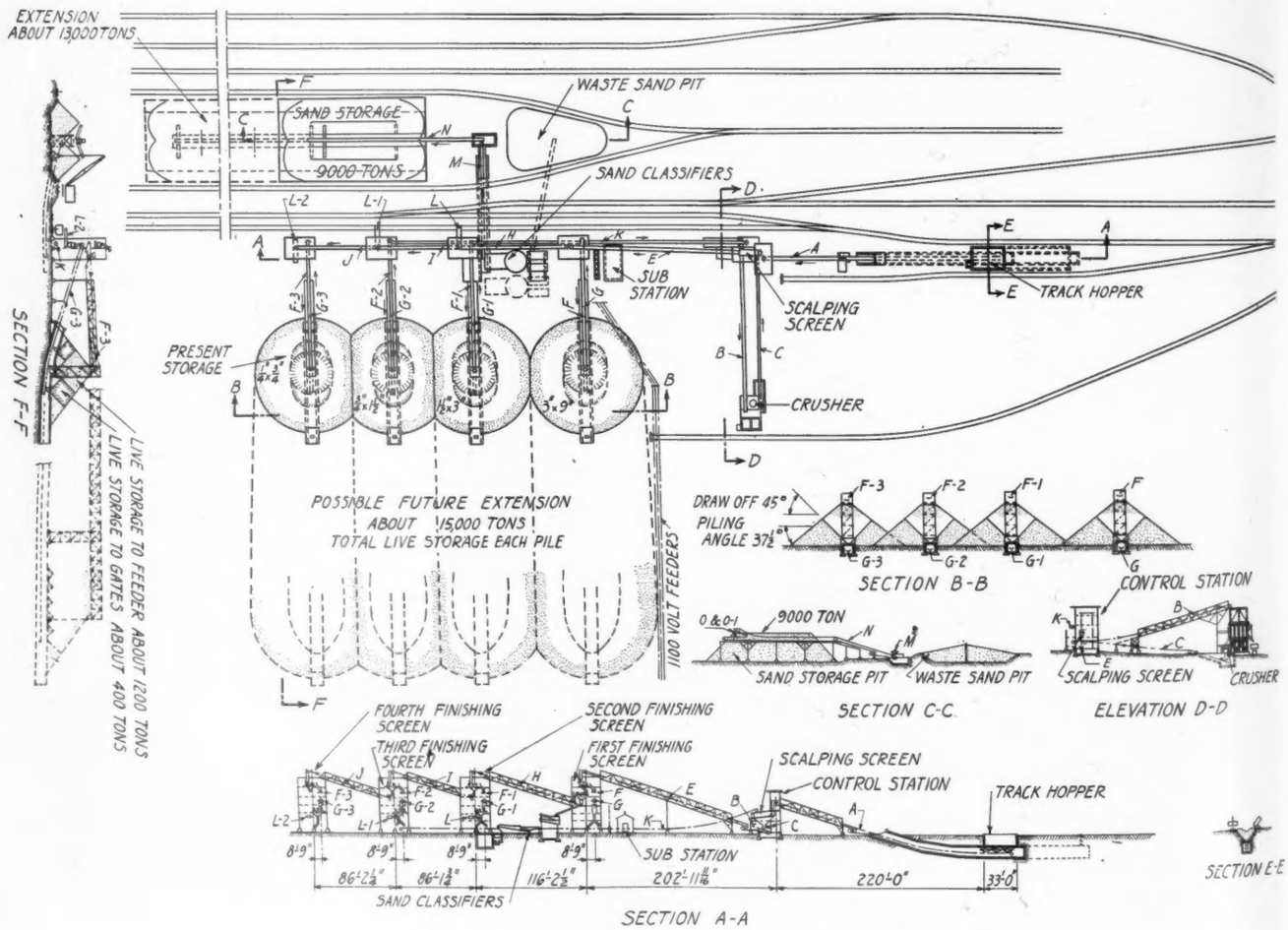
Electric vibrator feeders are used below the storage piles



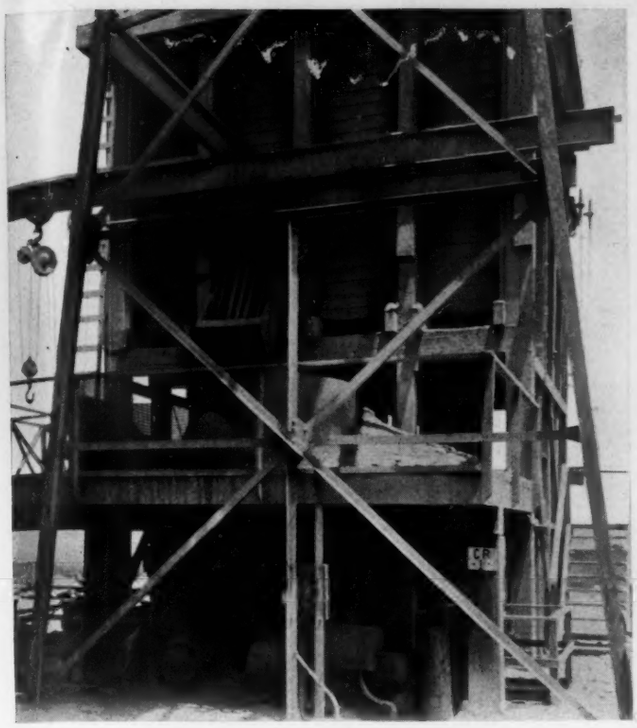
One of the sand pumps

zontal 30-in. belt, Conveyor F, located in an overhead gallery and delivering the cobbles to the live storage pile. As the product falls to the pile it cascades down a baffle arrangement, known as a stone ladder, to prevent excessive secondary breakage and at the same time is sprayed with a small amount of water to eliminate dust.

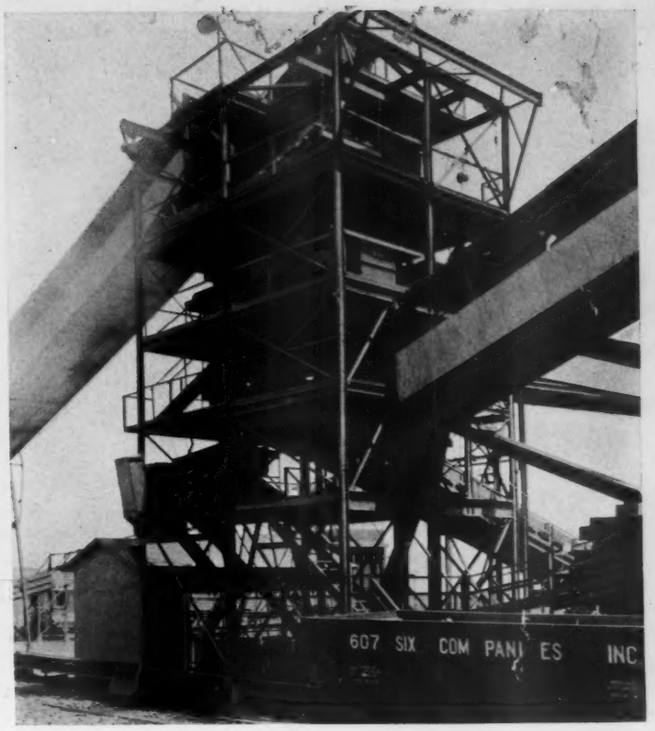
The throughs from these two vibrating screens fall to two desanding screens which have 1-in. mesh top decks and ¼-in. mesh lower decks, the top decks serving only as protection for the lower decks. These are both 4 ft. by 12 ft. screens and operate dry, as do the screens ahead of this set. The sand falls to the Dorr sand classifying system, which will be discussed later, while the oversize falls to an inclined belt, Conveyor H, 30 in. wide, which elevates and conveys the material to the second screen tower, where the 1½-in. to 3-in. gravel is prepared. In this tower are two double-deck Symons rocker screens, 4 ft. by 10 ft. in size, equipped with 3-in. mesh wire cloth on the top deck and 1½-in. mesh cloth on the lower deck. The oversize falls to a return belt which carries back to the rotary scalping screen, while the intermediate product falls to Conveyor F-1, 30 in. wide, and is delivered in the same manner as the cobbles to the storage pile. The throughs fall to belt I, 24 in. wide, which elevates and conveys the material to tower No. 3, where the next smaller size is taken out. Two 4-ft. by 10-ft. double-deck Symons rocker screens are also used here, the top decks having 1½-in.



General arrangement of sand and gravel plant



Crusher and bin above for oversize



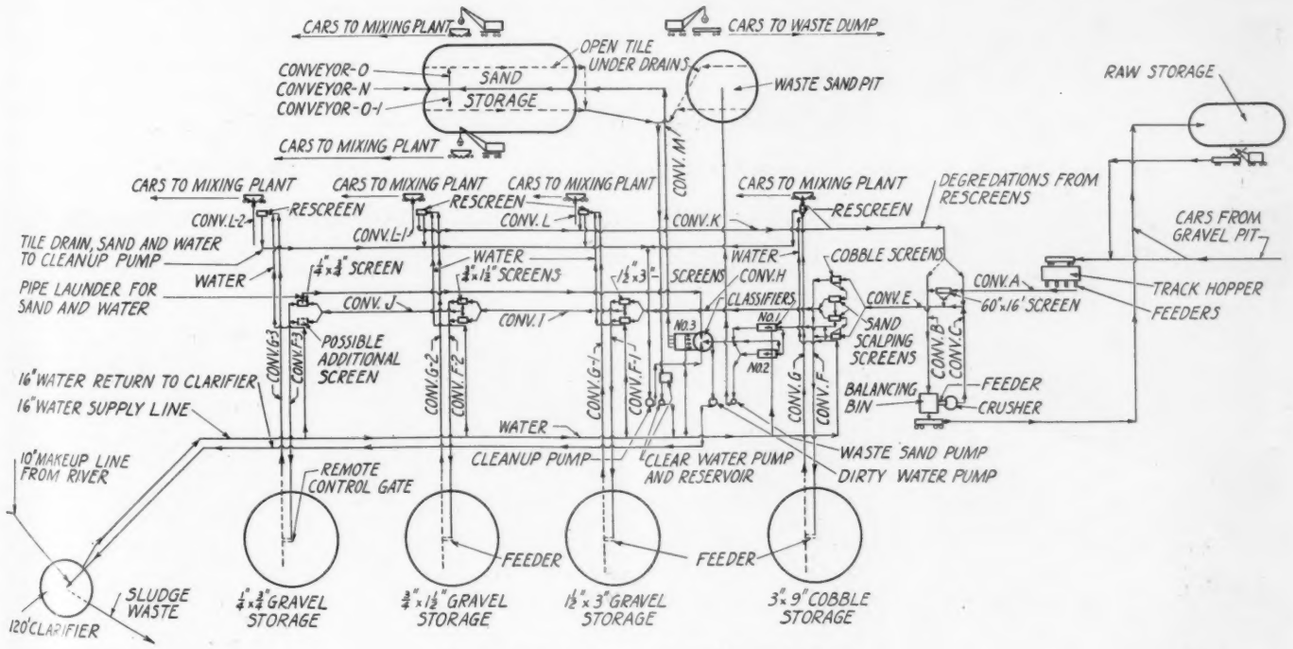
Tower housing the de-sanding screens

mesh wire cloth and the lower decks ¾-in. mesh cloth. The oversize from these screens falls to the return belt, while the intermediate product falls to Conveyor F-2, and is delivered to its storage pile. The fines fall to Conveyor J, which elevates and conveys the material to tower No. 4. Here there are two double-deck Symons screens with ¾-in. mesh cloth on the top deck and ¼-in. mesh cloth on the lower deck. These are the only screens which operate wet. The oversize from these screens falls to the return belt and the intermediate product to Conveyor F-3, which delivers it to the storage pile.

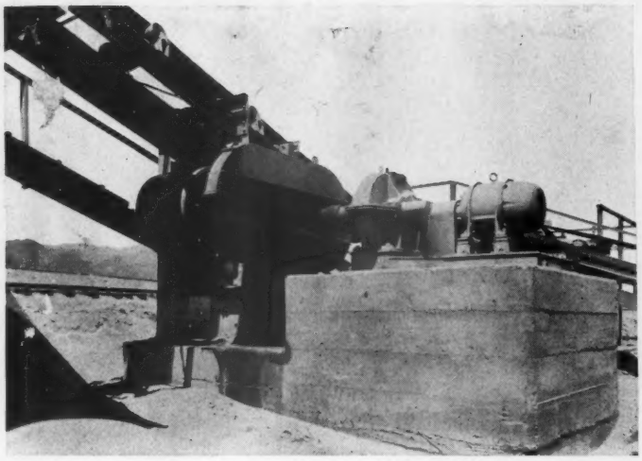
The use of a return belt after scalping is unusual, but it insures the accurate grading necessary to meet the specifications. This belt, K, 24 in. wide, also receives the intermediate throughs from the double deck rinsing rescreens that are used as the products are loaded to cars.

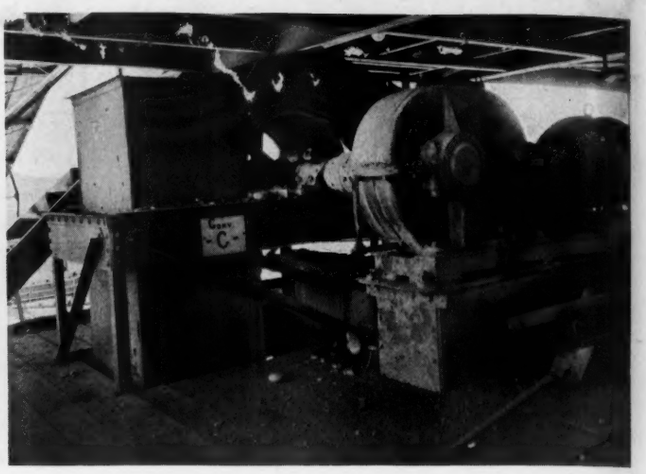
Under the four stockpiles are four tunnels, one for each pile, in which the four 30-in. belts, G, G-1, G-2 and G-3, operate. They deliver the separate sizes to a point above the loading apron and each discharges to a short shuttle conveyor. The shuttle conveyors are so constructed that they can be moved horizontally over the tops of the steel, hopper-bottom cars that are used for hauling the sized gravel and sand to the mixing plants and to the high-level storage piles.

Each size is loaded separately and is sprayed as it passes over the rescreen at the loading point. None of the aggregates are blended at the plant, as provisions have been made for doing this at the concrete mixing plant. The cars are handled at the loading point by a 40-ton Shay-geared steam locomotive.



Flow sheet of the sand and gravel plant





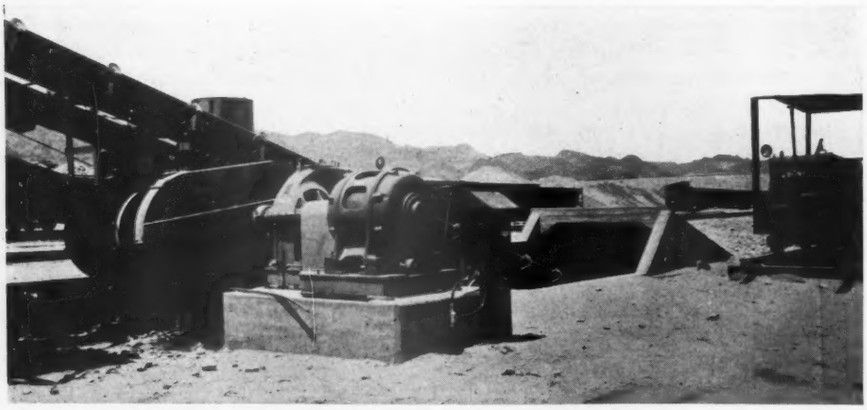
Two views of typical belt conveyor drives

All motors in the plant were supplied by the Westinghouse Electric and Manufacturing Co. and are controlled from a tower above the rotary scalping screen. From this position a single operator can see the entire plant and in case of trouble can shut off any motor in the operation. The pressing of a remote control button at this tower stops any particular motor, and though an interlocking system automatically stops all motors ahead of the unit in trouble. The motors can also, of course, be stopped by buttons located adjacent to them.

Where units like screens are in duplicate, a signal to the main control station permits cutting the feed in half and with this all diverted to the other unit by a flop gate, the unit in trouble can be thrown out of the interlocking system for repairs and the remainder of the plant run at half capacity. When out of the interlock, any unit is under control of the adjacent button for test running during repairs.

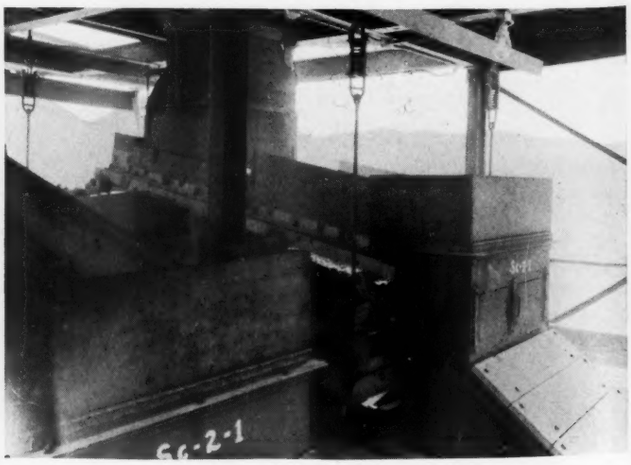
All control and switching equipment is in a separate fireproof, dust-proof building at approximately the center of gravity of the load and with the necessary transformer bank in an enclosure along one side. All wiring is in conduit and runs underground between the various units of the plant. The switchboard and control equipment was furnished by the Westinghouse Co.

As the sand must pass rigid specifications and as the raw material contains variable amounts of river silt, the washing of the sand is a difficult task at times. The sands from the de-sanding screens are flumed with water to a two-rake, Dorr classifier, which produces a drag product and an overflow product. The drag product is chuted to a Dorr bowl classifier. The overflow from the first drag passes to a second Dorr, two-rake drag classifier, which discharges its rake product to the same bowl classifier as the first rake. The overflow waters are returned to the sump and thence to the clarifying plant. The bowl classifier is provided with four rakes which discharge to a cross belt conveyor (Conveyor M, 24 in. wide) that delivers to a parallel conveyor. This conveyor (N, 24 in. wide) serves an "airplane tripper," which in turn discharges the wet sand to the drainage pits. The tripper is called an airplane type, as it discharges in two directions via short apron belt conveyors. These two belts projecting from the main structure give the equipment the



Main conveyor from track hopper. Track shifting machine at right

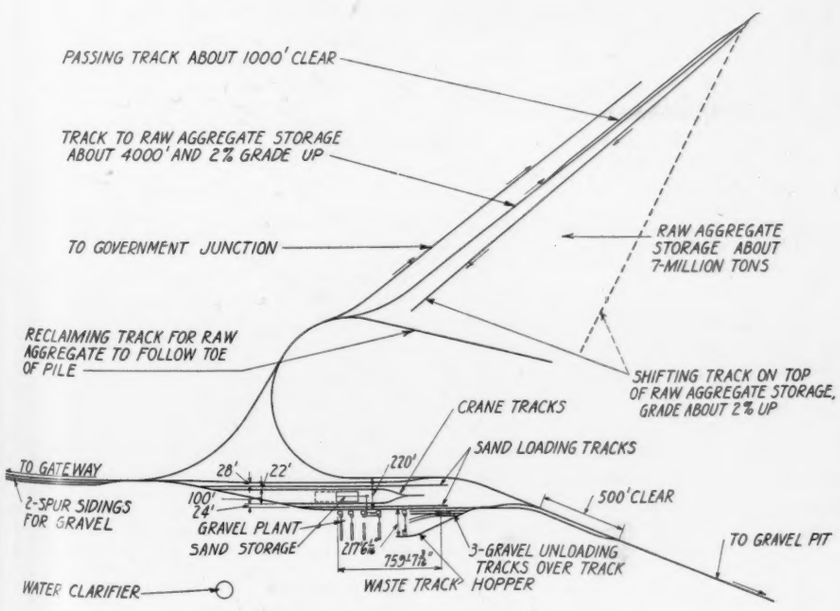
Hopper under de-sanding screen



One of the rocker arm type vibrating screens

All motors in the plant are push-button controlled from the central control tower shown at left. The main control board is shown at right

The "airplane" tripper used for stockpiling sand



Method of handling large raw aggregate storage

general appearance of a large airplane.

The flow diagram shows a pit for waste sands, which acts as a settling sump for waste water, and the entrained sands are settled out before sending the water to the clarifying plant. Byron Jackson and Wilfley pumps are used for handling both the waste and clear water.

The sands are, as shown in the flow diagram, classified into three sizes: ¼-in. by 28-mesh, 28- to 48-mesh and minus 48-mesh. The intermediate size is in excess and some is therefore wasted. The remainder is sufficient, with the other two sizes to give a blended product that is satisfactory. In the above flow the No. 1 Dorr rake gives the ¼-in. to 28-mesh product and the No. 2 Dorr the 28-in. to 48-mesh product.

A locomotive crane is used for loading the drained sand to cars and a standard-gage track runs along both sides of the sand storage and drainage pits. By the use of cranes for this work sand with a uniform water content can be obtained owing to the selective ability of such equipment. A Nordberg trackshifter is used for moving tracks.

The plant was designed by the engineering staff of Six Companies, Inc., under the direct supervision of T. M. Price, who has charge of the production and transportation of the sand and gravel.

The construction of the Hoover dam is directed by F. T. Crowe, general superintendent. Charles A. Shea, a director of Six Companies Inc., is director of construction and A. H. Ayers is chief engineer.

Propose City Quarry Be Made Into an Amphitheater

CIVIC ORGANIZATIONS at Reading, Penn., propose that a large natural amphitheater be laid out on the site of the former quarry facing the city on Mt. Penn. The quarry is owned by the city.

Plans of the organization for improvement of the site would be included in the city's $200,000 relief program to aid the unemployed.—*Marion* (Ohio) *Star*.

Triple-Deck Vibrating Screens for Scalping and Sizing Crushed Stone

Louisville Cement Co. Makes Changes at Milltown, Indiana, Crushing Plant

IN ORDER TO INCREASE the capacity and efficiency of its crushed-stone plant and provide a more uniform delivery of material, the Louisville Cement Co. of Louisville, Ky., has recently completed a number of major changes and improvements in its screening and handling equipment at its Milltown, Ind., plant. This plant is separate from the company's cement mill at Speed, Ind., some 50 miles distant, and is a large producer of crushed stone for commercial purposes in the southern end of Indiana and in the Louisville district.

The changes chiefly consist of the substitution of vibrating screens in place of the revolving screens that were formerly used. Also another crusher has been added for secondary crushing, and the new construction includes the necessary chutes, conveyors and elevators to handle the material for the new equipment.

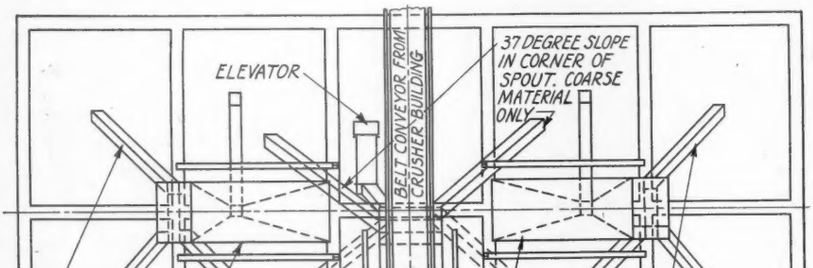
Two Scalping Screens in Closed Circuit

In the crushing house, the cars dump as formerly to a No. 12 Allis-Chalmers primary gyratory crusher. The crusher discharge is taken by a conveyor, set at 24 deg. to horizontal, up to a pair of 4 ft. by 8 ft. triple-deck Allis-Chalmers vibrating screens. These two vibrators replace a 60-in. by 20-ft. rotary scalping screen which was used in the old installation. They act as scalpers, sending the oversize to the secondary crushers on the floor below, while the throughs pass on a conveyor to the sizing screens. Although the size of material to be taken out here can be varied according to the screen surfaces put on the vibrators, generally the arrangement is to have the material which does not pass the top deck and the material off the second deck go to the secondary crushers, while the material from the third deck and the throughs go directly to the screen house.

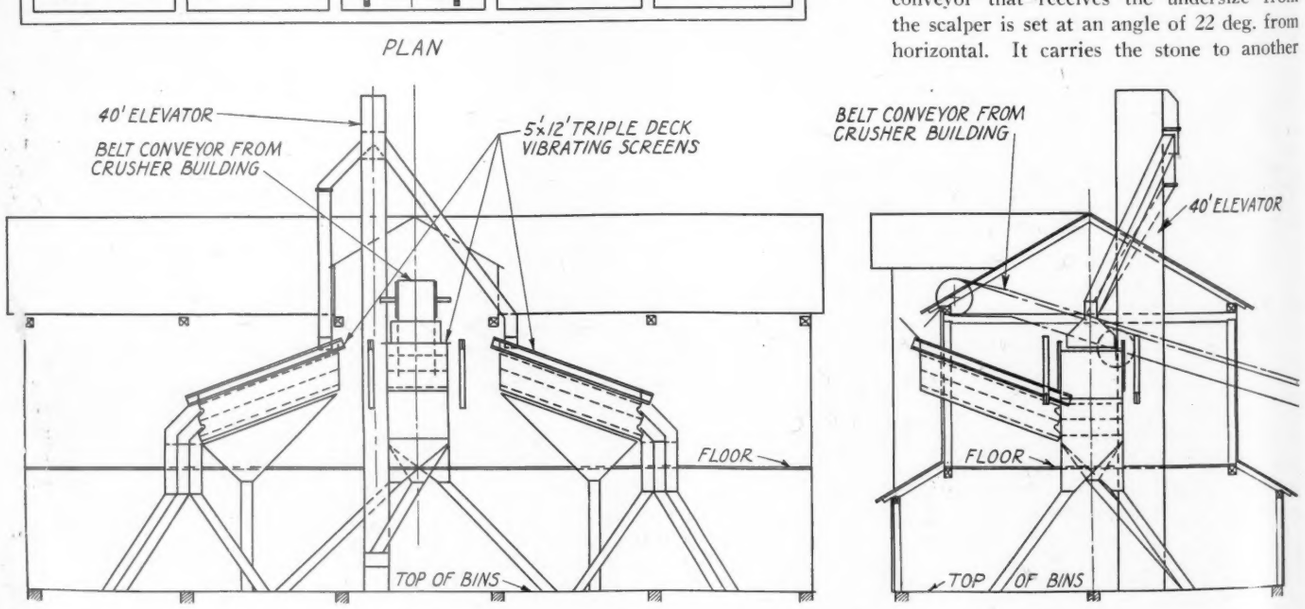
By using triple-deck screens for scalping, the company obtains a better separation and the possibility of blinding is largely eliminated. Little of the fines ever gets to the secondary crushers with this arrangement. It is possible, by changing chutes, to send the material which fails to pass the lowest deck to the crushers, if this is desired.

The rejects of the pair of scalpers fall directly to three Allis-Chalmers secondary crushers. Two of these were in place in the old installation, one being a No. 5 and the other a No. 7½. The other crusher, though not new, has just been installed at this plant. It is also a No. 7½, and was fitted with non-choking concaves at the time it was installed. This crusher is driven from the same line shaft which operates the other crushers in the crushing house. The shaft is driven by an electric motor, as the plant is entirely electrically operated.

The discharge of the three secondary crushers is returned by a bucket elevator to the scalping screens, making this an entirely closed-circuit crushing installation. The conveyor that receives the undersize from the scalper is set at an angle of 22 deg. from horizontal. It carries the stone to another


ELEVATOR
BELT CONVEYOR FROM CRUSHER BUILDING
37 DEGREE SLOPE IN CORNER OF SPOUT. COARSE MATERIAL ONLY
45 DEGREE SLOPE IN CORNER OF SPOUT
5'x12' TRIPLE DECK VIBRATING SCREEN
5'x12' TRIPLE DECK VIBRATING SCREENS
45 DEGREE SLOPE IN CORNER OF SPOUT

PLAN



Plan and elevation of vibrating screen installation

building, in which are located the sizing screens over the storage bins.

Here the material is delivered to a 5 ft. by 12 ft. Allis-Chalmers triple-deck vibrator for preliminary sizing. The material rejected by the upper deck of this screen can be sent to one or more of the bins through chutes carried out from the screen at an angle of 37 deg. to the horizontal. The other material is then generally chuted directly to a new bucket elevator and raised up so that it can be delivered to two other sizing screens on the same level as the one previously mentioned. These screens, which are also 5 ft. and 12 ft. Allis-Chalmers vibrators, are used for the final sizing of the material. These three vibrators replace the old revolving screens formerly used.

The accompanying illustration will show how the screens are placed in the plant with the preliminary sizing screen directly beneath the conveyor, and the other two set at right angles to the first one, and to the conveyor, thus extending out into the ends of the screen house. The elevator has an overall height of 40 ft. and is so arranged that it delivers the stone by means of chutes to either or both of the final sizing screens. Four chutes under each screen for the material from the three-decks and the fines passing the bottom deck carry the stone to a set of four bins under that particular screen, the arrangement being the same at each end of the plant, under each of the final sizing screens. These chutes extend out at 45 deg. to deliver the material approximately to the center of the bins.

"Dead-Bed" Feeds

An interesting feature of the new installation is the use made of "dead-bed" feeds for screens. That is, the company has used over its pair of scalping screens a small shelf in each chute, to catch the fall of the stone from the conveyor belt and permit it to wear, not on the lining of the chute, but on the stone already caught on the shelf instead. A similar arrangement has been used on the three screens in the sizing building with good success. The saving on the inside of the chutes from this wear of stone on stone is an important item in the maintenance of the plant.

The company hopes to obtain a much more uniform production with the change in equipment. It is expected that the plant will have a capacity of 125 to 150 tons of crushed limestone an hour, with the new screens and the new crusher, no matter what size stone is to be made. The capacity of the old equipment depended much on the kind of stone being made, since for some of the smaller sizes, the capacity was cut down to as low as 75 tons per hour because the revolving screens could not efficiently size the material.

These changes were made during the past spring and completed in June. H. Harry Lemmon, the superintendent at Milltown, was in charge of the new construction work.

Road Users Paying an Increasing Proportion of Cost

THE COMBINED INCOME from motor vehicle licenses and the gasoline tax supplied less than one-half of the total state and local rural highway income in 1930, according to a study made by the Industrial Conference Board, just received by the Department of Commerce.

The percentage is significant in view of the present controversy between motor carriers and railroads, the board stated, since the rural roads in question carry the bulk of motor traffic competing with railroads. The board's announcement follows in full text:

Registrations of motor vehicles increased from 10.5 million in 1921 to 25.8 million in 1931, and the average license tax receipts per motor vehicle advanced from $11.71 to $13.34. These figures are taken from a report on "The Taxation of Motor Vehicle Transportation," the completion of which is announced by the National Industrial Conference Board. This study was undertaken because of the many problems affecting the taxpayer that have arisen in connection with the rapid development of motor vehicle transportation. The report analyzes the problems of motor vehicle taxation, highway financing and administration, and coordination of rail and motor vehicle transportation.

At the end of 1929 there were 3,024,233 miles of rural highways in the United States —that is, highways outside of those maintained by cities and incorporated communities—of which 662,435 miles, or 22%, were surfaced. The total rural mileage has increased about 4% from 1904 to 1929, while mileage surfaced has increased about 330% in the same period. About 10% of the total rural miles of the country belongs to state highway systems, while 90% is included in county and local systems. About 66% of the state highway mileage, carrying more than half of the total traffic, has been paved.

Every state levies a motor fuel tax. The laws of 18 states provide that all the proceeds of the motor fuel tax shall be retained by the state and expended for state highway purposes, while in the remaining states receipts are divided between the state and the local governments in varying proportion. Sixteen states now divert some portion of the motor fuel tax to purposes other than highways. Receipts from the motor fuel tax have shown a remarkable growth in the period 1925-1931, inclusive. The gross receipts before deduction of refunds rose from 150.1 million dollars in 1925 to 569.8 million dollars in 1931, or an increase of 280%.

Taking the two forms of tax together, the Conference Board finds that in 1930 the total income from motor vehicle license taxes and fees and the motor fuel tax combined supplied less than half, or 45.8%, of the total state and local rural highway income. The remaining income for state and local rural roads was from property taxes and appropriations, bond issues, federal aid, and miscellaneous sources. Considering the state highways alone, the Conference Board finds that the proportion of income derived from combined motor vehicle license and motor fuel taxes increased from 28.4% in 1921 to 64.6% in 1930, with a slight tendency to decline since 1928.

The percentage of rural state highway income derived from the special motor vehicle taxes is particularly significant in the light of the present controversy between competing transportation agencies, since the main roads supported from this source of income carry the bulk of the motor traffic competing with the railroads. In other words, says the report, this percentage is sometimes considered a rough index of the extent to which motor vehicle operators are contributing to the cost of their roadbed.

In using this percentage, however, certain limitations are pointed out by the Conference Board, namely: (1) it does not indicate the proportion paid by truck and bus traffic; (2) in calculating the percentage the cost of city streets used by competing motor traffic is not taken into account; (3) the tax paid on fuel by railroads goes to the support of the roadbed of their competitors; and (4) in estimating road costs no account is taken of the cost of supervising traffic and the extra cost of railroad grade crossings.

Whether trucks and buses competing with railroad and other transportation agencies are paying their just share toward the cost of the highways over which they operate is at present an open question, states the report. Facts and figures are presented by the Conference Board that show a tendency for road users to pay an increasingly larger proportion of the cost of highways, thus relieving property owners.

The report also sets forth the different views held on highway tax burden. It shows that some are in favor of supporting roads largely from funds derived from general taxation on the ground of their general utility, thus placing highway expenditures in the same category with those for schools and police protection. On the other hand are those who support the theory that users of the highways should bear the larger part of the burden because they derive immediate and special benefits.—*United States Daily* (Washington, D. C.).

Texas Applies "Buy Home Products" to Road Materials

THE buy-home-products policy is being given application by the Texas state highway commission in entering an order that only Texas sand, gravel, stone, cement and asphalt be purchased for use in highway construction projects. The order is in conformity with a resolution adopted by the 42nd legislature directing that preference be given to Texas products in highway construction.—*Houston* (Tex.) *Post*.

Sand and Gravel Safety Contest of 1931*

By W. W. Adams
Chief Statistician, Demographical Division, U. S. Bureau of Mines

THE THIRD ANNUAL SAFETY CONTEST for plants producing sand and gravel, which was conducted in 1931 by the United States Bureau of Mines in cooperation with the National Sand and Gravel Association, registered further progress in safety as compared with the two previous annual contests. Both the accident-frequency rate and the accident-severity rate were reduced.

The period covered was the calendar year 1931; 60 plants participated and 17 states were represented by the participating companies.

The contest covered accidents and man-hours by all men at the participating plant who were employed by the same company; and it included work up to the point of delivery of the material directly to the consumer or to an independent agency of transportation—in other words, to the point of relinquishment of control of the material by the producer.

The purpose of the yearly contests for producers of sand and gravel is to aid in the promotion of safety among the employes and in the reduction of accident costs to the companies. The contests develop friendly rivalry among the various plants and among the employes of each individual plant in a concerted effort to prevent accidents.

The safety trophies are awarded annually, both of which are provided by Rock Products. One of the trophies is for the best safety record among plants that were in operation during the contest year 100,000 or more man-hours; the other trophy is for the best record among plants that were in operation less than 100,000 man-hours. Awards and the relative standing of the various plants are based upon statistical compilation by the Bureau of Mines of accident reports and employment reports furnished by the enrolled companies. Company reports are summarized at the close of each year, and the summaries are submitted to each company concerned for certification as to the accuracy of the summary and the completeness of the company's reports from which the summary was prepared. When the summary is returned signed by an official of the company, the records are considered to be a trustworthy basis for determining the relative standing of the various plants. The position of each plant is determined by its accident-severity rate; that is, the number of days of disability resulting from accidents for each 1000 man-hours of work by all employes.

Time Charges

In measuring the number of days of disability resulting from accidents, 6000 days are charged for each fatality. This figure has been used for many years in statistical studies of industrial accidents. It represents 20 years of 300 days each and was adopted as a fair approximation of the working expectancy of men of age 33, which was found to be the average age of men killed in industrial accidents. Permanent total disabilities are also given a time charge of 6000 days. The charge for each permanent partial disability is a certain percentage of 6000 days, depending upon the part of the body injured and the degree of disability. Temporary injuries are charged with the actual number of calendar days of disability, including Sundays, holidays and other idle days if the incapacity of the injured employe actually continued on those days. The total number of days of disability thus determined is used in calculating accident-severity rates.

Winners of Trophies for 1931

Among plants that worked 100,000 or more man-hours in 1931, the best safety record was that of the Van Sciver plant at Morrisville, Bucks county, Pennsylvania. This plant was operated by Warner Co. of Philadelphia, Penn. The Van Sciver plant is a lake-deposit operation, and its operations in 1931 covered 155,803 man-hours without a lost-time accident to any employe.

The trophy for the best safety record among plants that operated less than 100,000 man-hours was awarded to the Texas Construction Material Co., Houston, Tex., the award being based upon the safety record established by the company's Eagle Lake plant at Eagle Lake, Colorado county, Texas. The Eagle Lake plant is a wet-pit operation; it had no accidents in 1931 and its operations covered 86,847 man-hours.

Formal presentation of the trophies to the winning companies will be made at a time and place to be selected by the companies.

While all member companies engaged in producing sand and gravel are eligible to enroll in the yearly safety contests, there being no requirement as to number of employes or period during which the plant must be in operation, the plant that works the largest number of man-hours and whose record is free of accidents is awarded the trophy in preference to the plant whose record is also free of accidents but whose operations covered a smaller number of man-hours of work. Of course, if no plant is free of accidents, the lowest accident-severity rate determines the winner.

Of the plants enrolled in the contest, 30 had no lost-time accidents during the year. Twenty-nine of these plants were in the group whose operations were less than 100,000 man-hours. A certificate of merit is awarded to the operator of each plant which has a perfect safety record but which does not win the trophy because the winning companies work a larger number of man-hours.

As already stated, 60 plants participated in the contest in 1931; some plants enrolled early in the year and withdrew later because of shutdowns, or for some other reason. The 60 plants that remained in the contest worked 3,142,855 man-hours during the contest year; some of them, however, did very little work, judging from the number of man-hours of employment. Ninety-six injuries were reported, including one injury that resulted fatally; the disability charge of all accidents combined was 8710 days. If the single fatality is excluded the time charge is 2710 days. The accident-frequency rate for all plants combined was 30.5 accidents per million man-hours of exposure as compared with 42.7 for the previous year; the accident-severity rate for all plants was 2.8 days of disability for each thousand man-hours of exposure as compared with 5.9 for the previous year.

The general scope of the safety contest of 1931 is indicated by the figures in Tables 1 to 3, inclusive.

Causes of Injuries

Outstanding among the causes of accidents reported by the companies that participated in the 1931 safety contest were machinery and falls of persons. Handling objects ranked third and hand tools fourth. About 70% of the total number of injuries reported were chargeable to the four causes enumerated. Table 4 shows the causes of accidents for each of the several types of sand-and-gravel plants.

From the standpoint of accident-frequency rate the class of plants that established the best safety record (excluding several plants whose operations could not be classified under a single type) was lake-deposit operations. Lake-deposit plants had an accident-frequency rate of 6.5 per million man-hours of work. This rate, which covered three plants only and was based upon 308,000 man-hours of work, appears unusually low when compared with the previous year's rate of 38.5, which covered four plants and represented 648,907 man-hours of work. Wet-pit operations ranked second in low accident-frequency rate among the different types of plants with a rate of 25.2; river plants ranked third with a rate of 29.6, dry pits fourth with a rate of 30.9 and dry banks fifth with a rate of 43.2.

Comparative rates for frequency and severity of accidents at different types of plants are given in Table 5.

* Reprinted from U. S. Bureau of Mines Report of Investigations 3186.

From average figures covering two years of operations at lake plants and three years at other types of plants, the different types of sand-and-gravel plants rank as follows in relative safety from an accident-frequency viewpoint:

Type of plant	Accidents per million man-hours	Index (average 45.8 = 100%)
Lake	28.2	61.6
River	31.2	68.1
Dry pit	36.1	78.8
Wet pit	52.1	113.8
Dry bank	66.4	145.0
Average	45.8	100.0

Roll of Trophy Winners Since 1929

The winners of the safety trophies in the annual contests for the members of the National Sand and Gravel Association during the past three years now include the following companies:

1929 CONTEST—The trophy for companies that operated 100,000 or more man-hours was won by the American Aggregates Corp., whose Green Oak plant (a wet-pit operation) at Brighton, Mich., worked 320,355 man-hours and had 14 lost-time accidents resulting in 92 days of disability of the injured men. These figures indicated an accident-severity rate of 0.287 per thousand hours.

The trophy for plants operating less than 100,000 hours was awarded to the Urbana plant (a wet-pit operation) at Urbana, Tex., operated by the Urbana Sand and Gravel Co., whose record was 62,261 man-hours without a lost-time accident.

1930 CONTEST—The trophy for the larger plants was won by the Stewart Sand and Material Co., whose Missouri river plant (a river operation) had a record of 108,753 man-hours with no accidents that disabled an employe.

The trophy for the smaller plants was awarded to the Potts-Moore Gravel Co. for the safety record of its Waco plant (a dry-bank deposit) at Waco, Tex., of 79,881 man-hours without a lost-time accident.

1931 CONTEST—Larger plants: Warner Co.'s Van Sciver plant (a lake-deposit plant) at Morrisville, Penn., whose record was 155,803 man-hours of operation without a lost-time accident.

Smaller plants: Texas Construction and Material Co.'s Eagle Lake plant (a wet-pit operation) at Eagle Lake, Tex., with 86,847 man-hours and no accidents resulting in loss of time.

Relative Standing of Plants

The relative standing of the individual plants that were enrolled in the 1931 safety contest is shown in Table 6. As the figures for individual operations are confidential, the identity of the plants is not revealed, but each company has been advised of the position of its plants.

TABLE 1. ACCIDENT DATA FOR PLANTS COMPETING IN THE SAFETY CONTEST OF 1931, CLASSIFIED BY TYPE OF PLANT

Type of plant	No. of plants	Man-hours	Accident rates: Frequency	Accident rates: Severity
Dry bank	9	486,439	43.171	1.558
Dry pit	6	129,508	30.886	.857
Wet pit	9	634,678	25.210	1.223
River	28	1,318,976	29.568	.682
Natural lake	3	308,142	6.491	.055
Wet pit and river	3	166,819	35.967	36.369
Wet pit and dry pit	2	98,293	81.389	.834
Total, 1931	60	3,142,855	30.545	2.771
Total, 1930	76	4,915,592	42.721	5.094
Total, 1929	26	2,259,572	74.350	9.713

TABLE 2. ACCIDENTS CLASSIFIED BY SEVERITY OF INJURY

Type of plant	Fatal	Permanent: Total	Permanent: Partial	Temporary	Total
Dry bank	....	....	1	20	21
Dry pit	....	....	....	4	4
Wet pit	....	....	1	15	16
River	....	....	1	38	39
Natural lake	....	....	....	2	2
Wet pit and river	1	....	....	5	6
Wet pit and dry pit	....	....	....	8	8
Total, 1931	1	0	3	92	96
Total, 1930	4	0	2	204	210
Total, 1929	3	0	2	163	168

TABLE 3. CLASSIFICATION OF DAYS LOST BY SEVERITY OF INJURY

Type of plant	Fatal	Permanent: Total	Permanent: Partial	Temporary	Total
Dry bank	.....	....	300	458	758
Dry pit	.....	....	.....	111	111
Wet pit	.....	....	300	476	776
River	.....	....	300	599	899
Natural lake	.....	....	.....	17	17
Wet pit and river	6,000	....	.....	67	6,067
Wet pit and dry pit	.....	....	.....	82	82
Total, 1931	6,000	....	900	1,810	8,710
Total, 1930	24,000	....	900	4,072	28,972
Total, 1929	18,000	....	1,500	2,447	21,947

TABLE 4. CAUSES OF ACCIDENTS AT SAND AND GRAVEL PLANTS IN 1931

Cause	Dry bank: Accidents	Dry bank: Days lost	Dry pit: Accidents	Dry pit: Days lost	Wet pit: Accidents	Wet pit: Days lost	River: Accidents	River: Days lost
Machinery	7	608	....	....	2	317	9	373
Haulage	1	2	....	....	2	54	2	281
Explosions	....	....	1	7	....	....	....	....
Electricity	2	3	....	....	....	....	2	15
Fires	....	....	....	....	....	....	1	7
Hot substances	....	....	....	....	1	13	....	....
Falls of persons	2	9	1	25	4	177	9	95
Stepping on or striking against objects	2	18	....	....	1	11	3	54
Falling objects (not handled by injured)	....	....	1	69	....	....	1	4
Handling objects	4	94	1	10	2	77	7	41
Hand tools	3	24	....	....	2	14	4	15
Miscellaneous or causes not stated	....	....	....	....	2	113	1	14
Total	21	758	4	111	16	776	39	899

Cause	Natural lake: Accidents	Natural lake: Days lost	Wet pit and river: Accidents	Wet pit and river: Days lost	Wet pit and dry pit: Accidents	Wet pit and dry pit: Days lost	Total: Accidents	Total: Days lost
Machinery	....	....	....	....	2	28	20	1326
Haulage	....	....	....	....	....	....	5	337
Explosions	....	....	1	33	....	....	2	40
Electricity	....	....	....	....	....	....	4	18
Fires	....	....	....	....	1	2	2	9
Hot substances	....	....	....	....	1	7	2	20
Falls of persons	1	14	3	31	1	38	21	389
Stepping on or striking against objects	....	....	1	3	1	5	8	91
Falling objects (not handled by injured)	....	....	....	....	1	1	3	74
Handling objects	1	3	1	6000	....	....	16	6225
Hand tools	....	....	....	....	1	1	10	54
Miscellaneous or causes not stated	....	....	....	....	....	....	3	127
Total	2	17	6	6067	8	82	96	8710

TABLE 5. COMPARATIVE ACCIDENT DATA, CLASSIFIED BY TYPE OF PLANT

Type of plant	Year	Number of plants	Man-hours worked	Frequency rate	Severity rate
Lake	1931	3	308,142	6.5	0.1
	1930	4	648,907	38.5	0.4
River	1931	28	1,318,976	29.6	0.7
	1930	35	1,925,899	30.1	3.8
	1929	3	121,403	65.9	0.8
Dry pit	1931	6	129,508	30.9	0.9
	1930	4	209,972	33.3	1.5
	1929	1	48,448	61.9	0.9
Wet pit	1931	9	634,678	25.2	1.2
	1930	9	851,969	50.5	15.4
	1929	10	1,122,207	68.6	0.7
Dry bank	1931	9	486,439	43.2	1.6
	1930	22	1,104,694	62.5	7.0
	1929	12	967,514	82.7	21.7

TABLE 6. RELATIVE STANDING OF INDIVIDUAL PLANTS IN SAND AND GRAVEL SAFETY CONTEST OF 1931, ARRANGED ACCORDING TO ACCIDENT-SEVERITY RATES*

			Number of accidents					Number of days of disability						
Rank	Type of plant	Hours worked	Fatal	P. T.	P. P.	Temp.	Total	Fatal	P. T.	P. P.	Temp.	Total	Frequency rate	Severity rate
1	Lake	155,803	....	....	....	....	0	....	....	....	....	0	0.000	0.000
2	Wet pit	86,847	....	....	....	....	0	....	....	....	....	0	.000	.000
3	Wet pit	81,386	....	....	....	....	0	....	....	....	....	0	.000	.000
4	Bank	72,352	....	....	....	....	0	....	....	....	....	0	.000	.000
5	River	67,715	....	....	....	....	0	....	....	....	....	0	.000	.000
6	River	57,787	....	....	....	....	0	....	....	....	....	0	.000	.000
7	Dry pit	40,715	....	....	....	....	0	....	....	....	....	0	.000	.000
8	River	33,570	....	....	....	....	0	....	....	....	....	0	.000	.000
9	River	30,426	....	....	....	....	0	....	....	....	....	0	.000	.000
10	River	23,679	....	....	....	....	0	....	....	....	....	0	.000	.000
11	Bank	23,555	....	....	....	....	0	....	....	....	....	0	.000	.000
12	River	21,444	....	....	....	....	0	....	....	....	....	0	.000	.000
13	River	20,538	....	....	....	....	0	....	....	....	....	0	.000	.000
14	Bank	20,531	....	....	....	....	0	....	....	....	....	0	.000	.000
15	Dry pit	19,061	....	....	....	....	0	....	....	....	....	0	.000	.000
16	River	17,900	....	....	....	....	0	....	....	....	....	0	.000	.000
17	River	17,629	....	....	....	....	0	....	....	....	....	0	.000	.000
18	River	17,132	....	....	....	....	0	....	....	....	....	0	.000	.000
19	Wet pit and river	16,317	....	....	....	....	0	....	....	....	....	0	.000	.000
20	Bank	14,427	....	....	....	....	0	....	....	....	....	0	.000	.000
21	River	13,803	....	....	....	....	0	....	....	....	....	0	.000	.000
22	River	13,778	....	....	....	....	0	....	....	....	....	0	.000	.000
23	River	9,360	....	....	....	....	0	....	....	....	....	0	.000	.000
24	River	8,802	....	....	....	....	0	....	....	....	....	0	.000	.000
25	Dry pit	7,994	....	....	....	....	0	....	....	....	....	0	.000	.000
26	River	7,250	....	....	....	....	0	....	....	....	....	0	.000	.000
27	River	5,630	....	....	....	....	0	....	....	....	....	0	.000	.000
28	River	5,191	....	....	....	....	0	....	....	....	....	0	.000	.000
29	River	3,830	....	....	....	....	0	....	....	....	....	0	.000	.000
30	Dry pit	254	....	....	....	....	0	....	....	....	....	0	.000	.000
31	River	200,153	....	....	....	1	1	....	....	....	6	6	4.996	.030
32	Wet pit	40,242	....	....	....	1	1	....	....	....	3	3	24.850	.075
33	Lake	133,715	....	....	....	1	1	....	....	....	14	14	7.479	.105
34	Bank	64,317	....	....	....	3	3	....	....	....	10	10	46.644	.155
35	Lake	18,624	....	....	....	1	1	....	....	....	3	3	53.694	.161
36	Dry pit	52,940	....	....	....	1	1	....	....	....	10	10	18.889	.189
37	River	152,911	....	....	....	7	7	....	....	....	40	40	45.778	.262
38	River	51,240	....	....	....	1	1	....	....	....	14	14	19.516	.273
39	Bank	26,364	....	....	....	1	1	....	....	....	8	8	37.931	.303
40	River	210,497	....	....	....	8	8	....	....	....	77	77	38.005	.366
41	Wet pit	45,170	....	....	....	1	1	....	....	....	17	17	22.139	.376
42	Wet pit	139,673	....	....	....	5	5	....	....	....	53	53	35.798	.379
43	River	17,247	....	....	....	2	2	....	....	....	8	8	115.962	.464
44	River	14,870	....	....	....	1	1	....	....	....	8	8	67.24	.538
45	River	78,312	....	....	....	3	3	....	....	....	49	49	38.308	.626
46	Wet pit and river	103,583	....	....	....	5	5	....	....	....	67	67	48.270	.647
47	Dry and wet pit	79,498	....	....	....	7	7	....	....	....	58	58	88.053	.730
48	Wet pit	72,445	....	....	....	2	2	....	....	....	57	57	27.607	.787
49	River	115,291	....	....	....	9	9	....	....	....	94	94	78.063	.815
50	Bank	48,723	....	....	....	2	2	....	....	....	58	58	41.048	1.190
51	Dry and wet pit	18,795	....	....	....	1	1	....	....	....	24	24	53.206	1.277
52	Wet pit	46,721	....	....	....	2	2	....	....	....	103	103	42.807	2.205
53	Bank	160,170	....	....	1	12	13	....	....	300	132	432	81.164	2.697
54	Wet pit	26,805	....	....	....	1	1	....	....	....	110	110	37.306	4.104
55	Bank	56,000	....	....	....	2	2	....	....	....	250	250	35.714	4.464
56	Wet pit	95,389	....	....	1	3	4	....	....	300	133	433	41.934	4.539
57	River	50,241	....	....	....	4	4	....	....	....	292	292	79.616	5.812
58	River	52,750	....	....	1	2	3	....	....	300	11	311	56.872	5.896
59	Dry pit	8,544	....	....	....	3	3	....	....	....	101	101	351.124	11.821
60	Wet pit and river	46,919	1	....	....	....	1	6,000	....	....	....	6,000	21.313	127.880
Totals and averages, 1931		3,142,855	1	0	3	92	96	6,000	0	900	1,810	8,710	30.545	2.771
Totals and averages, 1930		4,915,592	4	0	2	204	210	24,000	0	900	4,072	28,972	42.721	5.894

*As the accident reports from the companies are considered confidential by the U. S. Bureau of Mines, the identity of the plants to which this table relates is not revealed. P. T. means permanent total disability; P. P. means permanent partial disability; Temp. means temporary disability. Frequency rate indicates the number of fatal, permanent and other lost-time accidents per million man-hours of exposure; severity rate indicates the number of days lost from accidents per thousand man-hours.

Are Quarries Reducing Safety Vigilance?

AN UNUSUALLY large number of accidents has been reported at quarries and sand and gravel plants in recent weeks. A number of these are of the "unusual" type, which emphasizes the importance of constantly being alert to hazardous conditions about the quarry and plant. A number of accidents recently reported follow:

George Traeger, who is employed at a rock crusher south of Braymer, Mo., was badly scalded about the face and neck by steam escaping from the radiator on an air compressor unit.

Carl Metzger was injured while at work at the Wapakoneta Sand and Gravel Co., Wapakoneta, Ohio. He received internal injury by lifting some heavy machinery.

James Allman, 73, died in the St. Louis County Hospital of injuries received when a concrete pier fell on him in the Davidson quarry at Webster Groves, Mo. He was an employe at the quarry.

Struck by a flying piece of rock while working for the Millwood Sand plant at Mt. Vernon, Ohio, Cecil Mills of Millwood suffered a severe cut on the back of his head.

August Begeman, an employe at the Wood's rock quarry, nine miles north of Slater, Mo., was seriously injured there recently. Mr. Begeman was placing a stick of dynamite in a drilled hole when in some way the dynamite exploded, striking him in the face. The right eye was destroyed and it is feared he will lose sight in the other eye also. His whole face, neck and throat were severely wounded.

Accident Experience at Washington Quarries

ACCIDENT Experience and Cost of Accidents at Washington Metal Mines and Quarries is the title of Technical Paper 514, recently issued by the Bureau of Mines. Operating statistics, industrial insurance law, accident prevention regulations, accident experience and cost of compensable accidents are among the subjects covered in the paper.

The author believes that accident costs in Washington can be reduced if more frequent and rigid accident-prevention methods are practiced and protective devices used.

Accident Prevention in Alabama Quarries

NOT A SINGLE fatal accident occurred in the stone quarrying industry of Alabama in 1931, although the industry was in operation for 4,320,905 man-hours, a report by the Bureau of Mines states. The accident rate for the year indicated 42 accidental injuries to the employes for each million man-hours of work performed. These figures include all reporting crushed rock plants, stone dressing plants, and cement and lime manufacturers. Sand and gravel plants are not included.

Grinding Plant Research*

Part VII—Tests on Standard Sand in Experimental Mill

By William Gilbert
Wh.Sc., M. Inst. C. E., London, England

Further Tests on M.V. Ratio

Three further tests were made, the ratio of the sand volume to the volume of the voids being 100, 55 and 35% respectively. The sand volume is that measured at the beginning of the test, but there is a substantial increase after grinding. It was estimated by taking the weight of a small platinum crucible when filled with standard sand and when filled with ground sand. The increase of volume was about 36%.

The results obtained from the four tests are given in Table VI.

A graph similar to that of Fig. 35 was prepared for each test and the four curves were found to be nearly alike. In each case the sieve test results were somewhat erratic in the early stages, but later all the points fell on to a smooth curve.

The graph in Fig. 35 gives the relative power required for grinding to various residues on the 180-mesh sieve. With standard sand, curves nearly alike in shape are obtained when using either 1-in. steel balls, cylpebs, or small flints, although the output obtained and the horsepower required may vary considerably.

M.V. Ratio with Cylpebs

The experiments were repeated, using cylpebs instead of steel balls. The cylpebs had an average length of 1.27 in., diameter of 0.70 in. and a weight of 2.15 oz. each. A charge of 300 lb. was used. The cylpebs were quite new and had sharp edges.

Proceeding as in the previous test, the surface of the charge was found to be 1 in. below the center line of the mill, and 830 cu. in. of water was required to fill the voids.

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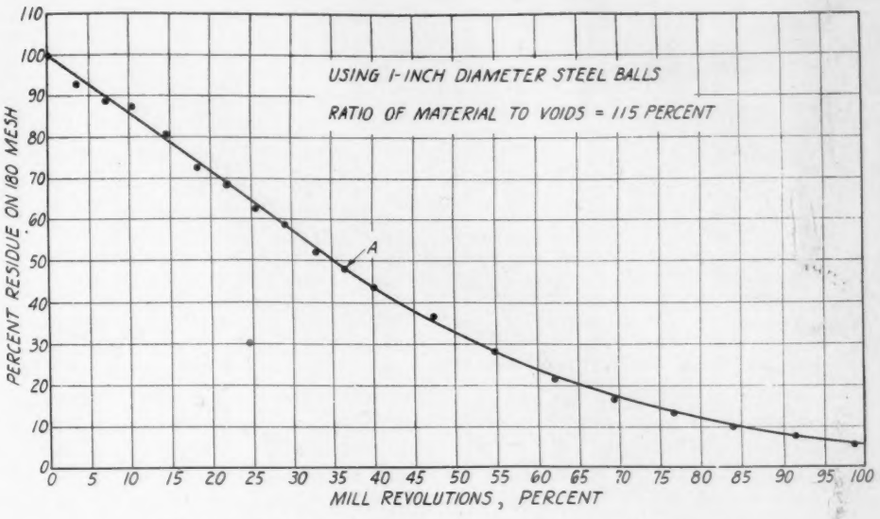

USING 1-INCH DIAMETER STEEL BALLS
RATIO OF MATERIAL TO VOIDS = 115 PERCENT
PERCENT RESIDUE ON 180 MESH
MILL REVOLUTIONS, PERCENT
A
0 10 20 30 40 50 60 70 80 90 100 110
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

Fig. 35. Relation between mill revolutions and fineness

The charge volume was calculated to be 42.8%, or 1893 cu. in., since the mill volume was 4422 cu. in. The ratio of the void volume to the charge volume was $\frac{830 \times 100}{1893} = 43.9\%$.

The results of these tests are listed in Table VII and the outputs for different ratios are plotted in Fig. 36. It will be seen from the graph that the best value of the M.V. ratio was 70%—the mill output being 31 lb. per hour, ground to a residue of 5% on 180 mesh. Comparing the two curves it is seen that the 1-in. steel balls gave a larger output. Of the four experiments with cylpebs No. 7 showed the highest output, and the lowest horsepower per ton ground per hour.

Details of this test, as regards the mill revolutions, and the sieve residues percent., are given in Table VIII. The mill revolutions per cent. were plotted against the sieve residues on 180 mesh as in the previous tests, and it was found that the curves were nearly alike, whether the grinding is performed by 1-in. steel balls, or by cylpebs, although the latter were less efficient.

The tests previously described were made at one speed, but the volume of the sand in the mill at the beginning of each test varied from 35 to 115% of the volume of the voids. The experiments were continued in order to try out the effect of varying the speed. The

TABLE VI

18-in. mill, grinding to 5% on 180 mesh with a charge, 1-in. steel balls, lining plates with lifter bars

	Charge of sand, lb.	Ratio of sand to voids, percent. (M.V. ratio) At beginning	Ratio of sand to voids, percent. (M.V. ratio) At end	Revolutions for 5% on 180 mesh Total	Revolutions for 5% on 180 mesh Per pound of sand	Average mill r.p.m.	Speed factor, Sf.	Horsepower supplied	Output, pounds per hour at 47 r.p.m.	Hp. per ton ground per hour	Hp. per ton ground per hour. Mill friction deducted	Sand volume. Increase, percent.
Test No. 1	48.70	115	156	4100	84.2	47.0	193.0	0.85	33.6	56.6	46.6	35.4
Test No. 2	42.35	100	137	3405	80.4	47.0	193.0	0.928	35.1	59.2	49.6	36.7
Test No. 3	23.29	55	75	1955	84.0	46.9	192.5	0.882	33.6	58.8	48.8	35.6
Test No. 4	14.82	35	48	1470	99.2	46.7	191.7	0.863	28.4	67.9	56.0	35.7

TABLE VII

18-in. mill grinding to 5% on 180 mesh with cylpebs, lining plates with lifter bars

	Charge of sand, lb.	Ratio of sand to residue on 180 mesh voids, percent. (at beginning)	Mill revolutions for 5% Total	Mill revolutions for 5% Per pound of sand	Mill average r.p.m.	Speed factor, Sf.	Horsepower supplied	Output, lb. per hour at 47 r.p.m.	Hp. per ton ground per hour	Hp. per ton ground per hour. Mill friction deducted
Test No. 5	51.75	115	5700	110.2	46.7	191.6	0.911	25.6	79.7	66.5
Test No. 6	45.00	100	4520	100.5	47.0	193.0	0.897	28.1	71.5	59.5
Test No. 7	24.75	55	2270	91.6	46.6	191.3	0.845	30.7	61.6	50.6
Test No. 8	15.75	35	1540	97.8	46.8	192.0	0.857	28.8	66.6	55.0

TABLE VIII. TEST No. 7 WITH CYLPEBS

Ratio of sand to voids, 55%
Mill average r.p.m. = 47

Total mill revolutions	Sieve residues, percent 180 mesh	100 mesh	76 mesh	50 mesh	30 mesh
100	94.0	90.3	85.6	74.9	44.8
200	88.2	78.1	69.3	51.4	22.1
300	81.9	69.2	58.4	37.3	10.0
400	76.0	59.8	48.0	24.5	4.2
500	71.9	52.2	36.5	16.9	1.9
600	62.2	43.5	28.6	10.0	0.7
700	57.3	34.8	21.8	5.2	0.3
800	52.0	27.6	14.7	2.9	....
900	48.4	24.0	10.6	1.5	....
1000	42.0	18.4	6.3	0.7	....
1100	38.7	13.4	3.6	0.2	....
1200	32.9	8.9	2.3	....	....
1300	29.3	7.0	1.3	....	....
1400	26.0	5.6	0.6	....	....
1500	22.3	4.0	....	....	....
1600	18.9	2.8	....	....	....
1700	16.0	1.0	....	....	....
1800	13.5	0.6	....	....	....
1900	10.7	0.2	....	....	....
2000	8.9	....	....	....	....
2100	7.0	....	....	....	....
2200	5.9	....	....	....	....
2300	4.9	....	....	....	....

M. V. ratio used varied from 70 to 100%, but over this range the mill efficiency is nearly constant as shown in Fig. 36.

The results are given in Table IX in which the earlier tests are included. The sand was ground to a residue of 5% on 180 mesh in all cases. The number of mill revolutions required in each instance was determined as already explained and the quantity ground per hour was calculated.

Two additional tests were made at lower speeds. Using 1-in. balls (Nos. 19 and 20), the M.V. ratio being 75%. A better output was obtained (see col. 4) showing that a speed factor of 193 is too high for lining plates provided with lifter bars. The horsepower per ton ground per hour was also less, as shown by cols. 5 and 6.

Using cylpebs, the additional tests are Nos. 13 to 18 inclusive. Here again improved results were obtained at the lower speeds, as will be seen from cols. 4, 5 and 6.

A test was also made using holpebs which are short lengths cut from steel piping. The holpebs had an outside diameter of ¾ in., an inside diameter of 7/16 in., a length of 1⅛ in. and weighed 1½ oz. each.

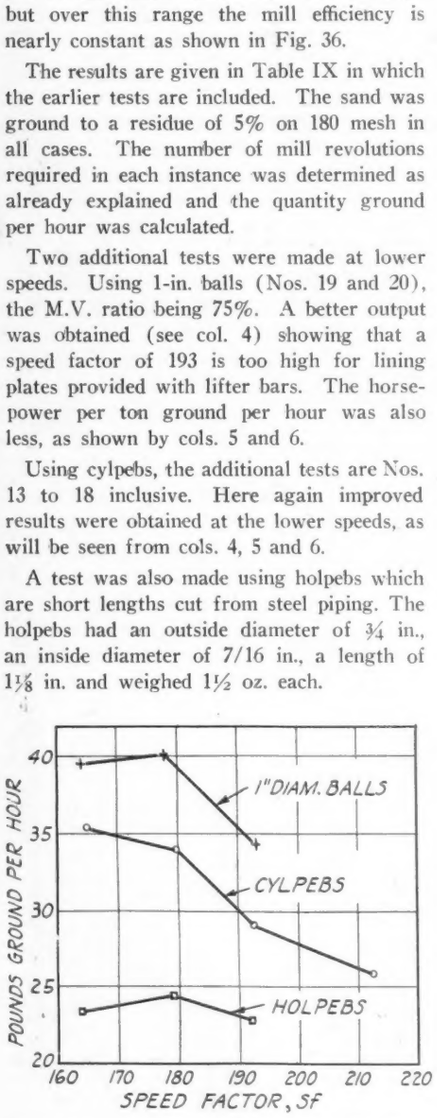


Fig. 40. Relation between speed factor and output

TABLE IX

18-in. mill, lining plates with lifter bars, grinding to 5% residue on 180 mesh

Experiment No.	Speed factor, Sf.	Ratio sand to voids, percent.	Sand ground per hour, lb.	Hp. per ton ground per hour	Hp. per ton ground per hr. Mill friction deducted	Detail of charge
19	164	75	39.5	49.8	41.9	300
20	178	75	40.1	51.1	43.2	lb.
4	192	35	28.2	67.9	56.0	1-in.diam.
3	193	55	33.5	58.8	48.8	steel balls.
2	193	100	35.1	59.2	49.6	Charge
1	193	115	33.6	56.6	46.6	40.7%
18	165	75	35.4	57.5	48.6	
17	180	70	34.8	55.3	46.3	
16	180	100	33.3	54.9	45.5	300
8	192	35	28.8	66.6	55.0	lb.
7	192	55	30.8	61.6	50.6	of
13	193	100	28.4	64.6	52.9	cylpebs.
6	193	100	28.1	71.5	59.5	Charge
5	192	115	25.6	79.7	66.5	42.8%
15	212	70	25.4	80.4	66.2	
14	213	100	26.5	73.0	59.5	
12a	164	75	23.4	68.6	55.3	225
12	179	75	24.4	73.6	60.8	lb. of
11	193	50	22.2	77.4	62.3	holpebs.
10	192	75	22.8	78.5	63.7	Charge
9	194	100	17.4	85.1	65.8	47.6%

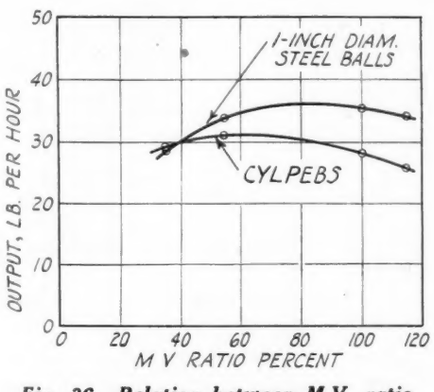


Fig. 36. Relation between M.V. ratio and output with steel balls and with cylpebs

A charge of 224 lb. was put into the mill and leveled and the volume of the voids determined by pouring in a measured quantity of water, as previously described. The surface of the charge was 5/16 in. below the center line of the mill, so that the charge volume was 47.6%, or 2110 cu. in. The void volume was 1318 cu. in., or 62.5% of the charge volume. Hence, for an M.V. ratio of 100% the sand put into the mill was

$$\frac{1318}{1728} \times 93.8 = 71.5 \text{ lb.}$$

A summary of the experiments is given in Table No. IX.

Referring to Experiments Nos. 9, 10 and 11, with a speed factor of approximately 193, it will be seen that the best output was obtained with a M.V. ratio of 75%, the weight of sand being 53.5 lb. The weight of sand required to give a M.V. ratio of 75%, with the same charge volume of 1 in. dia. steel balls, is only 31.8 lb. It appears from Experiment No. 9 that a M.V. ratio of 100% is too large for holpebs. Better results were obtained at lower speeds as shown by Experiments Nos. 12 and 12a.

Holpebs were used to a considerable extent a few years ago, in England, for the purpose of replacing flint stones in tube mills. The output was considerably increased, and the additional strain on the mill gearing was less than it would have been with the same charge volume of steel balls.

Graph of Results

To enable the results so far obtained from the 18 in. mill tests to be readily appreciated, the graphs shown in Figs. 40 and 41 have been prepared from Table IX. To avoid confusion some of the results obtained from experiments, made under nearly similar conditions, have been averaged.

In Fig. 40 the mill output in pounds per hour, ground to a residue of 5% on 180 mesh, is plotted against the speed factor. For 1 in. balls and cylpebs the value of the speed factor for maximum output appears to come between 160 and 180 when the lining plates are provided with lifter bars.

It will be seen that the 1 in. balls gave a better output than cylpebs, and that cylpebs were better than holpebs. It will be remembered, however, that the mill carried a smaller weight of holpebs. The corresponding values of the horsepower per ton ground per hour are plotted against the speed factors in Fig. 41. The horsepower required to drive the mill when empty, at the various speeds, has been deducted, so that the figures represent, very nearly, the horsepower

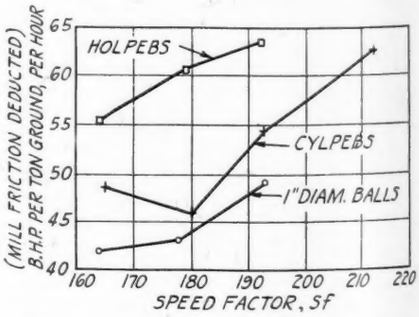


Fig. 41. Relation between speed factor and horsepower

TABLE X. SPEED TRIALS IN 18-IN. MILL, WITH SMOOTH LINING PLATES, AND STEEL BALLS AND CYLPEBS

	STEEL BALLS				STEEL BALLS				CYLPEBS			
Description of grinding bodies	1¾ in. diam.				1 in. diam.							
Weight of charge used	300 lb.				300 lb.				300 lb.			
Charge volume, per cent	42.9				40.5				41.5			
Weight of average grinding body	12.6 oz.				2.35 oz.				2.15 oz.			
Weight of sand used	35 lb.				35 lb.				35 lb.			
Ratio of sand to voids, per cent	75	75	75	75	85	85	85	85	81	81	81	81
Mill average, r.p.m.	40.1	44.1	48.0	52.0	39.9	44.1	48.1	52.1	40.2	44.3	47.6	52.9
Speed factor, sf.	164	181	197	213	163	181	197	214	165	182	195	217
Revolutions to grind to 5% on 180 mesh	2994	2962	2906	3228	2182	2149	2032	2468	2378	2418	2650	3156
Hp. supplied	0.826	0.872	0.968	1.056	0.795	0.850	0.926	1.05	0.87	1.016	1.088	1.032
Quantity ground per hour, lb.	28.2	31.2	34.6	33.8	38.4	43.1	49.8	44.4	35.4	38.5	37.8	35.2
Hp. per ton ground per hour	65.6	62.5	62.6	70.0	46.4	44.1	41.6	53.0	55.0	58.6	64.4	65.8
Hp. per ton, mill friction deducted	54.4	52.2	52.3	58.1	38.1	36.5	34.6	43.8	46.1	50.3	55.1	54.5

TABLE XI. SPEED TRIALS IN 18-IN. MILL, WITH SMOOTH LINING PLATES AND FLINT STONES

	LARGE FLINTS,				MEDIUM FLINTS,				SMALL FLINTS,			
Description of grinding bodies	2⅞ in. diam.				1¾ in. diam.				1 5/16 in. diam.			
Weight of charge used	110 lb.				110 lb.				110 lb.			
Charge volume, per cent	45				45				45			
Average weight of grinding body	7.68 oz.				4.36 oz.				1.62 oz.			
Weight of sand used	35 lb.				35 lb.				35 lb.			
Ratio of sand to voids, per cent	76	76	76	76	76	76	76	76	76	76	76	76
Mill average, r.p.m.	40.2	44.0	48.1	52.0	40.1	44.0	48.0	52.1	40.1	44.1	48.0	51.8
Speed factor, sf.	165	180	197	213	165	180	197	214	165	181	197	213
Revolutions to grind to 5% on 180 mesh	10,000	10,280	10,750	14,250	9,700	8,320	8,300	9,200	7,350	6,850	6,900	8,200
Hp. supplied	0.565	0.618	0.510	0.530	0.483	0.443	0.541	0.532	0.395	0.418	0.425	0.467
Quantity ground per hour, lb.	8.44	9.00	9.40	7.66	8.68	11.11	12.15	11.88	11.46	13.50	14.60	13.30
Hp. per ton ground per hour	150	154	122	155	125	89	100	100	77	69	65	79
Hp. per ton, mill friction deducted	113	117	84	104	88	60	71	67	50	45	41	49

expended in cascading the charge. The advantage of the 1 in. steel balls is again manifest.

When studying the graphs it should be remembered that charge volumes of over 40% were used (see col. 7 of Table IX). The effect of speed in conjunction with smaller charges of steel balls and cylpebs will be made clear later on.

Repeat Tests

Mr. Blyth was not altogether satisfied with the result of the experiments on holpebs, and a further test was made at his request. He suggested that 1 in. steel balls, cylpebs, and holpebs should be again compared, using the same weight of grinding bodies as before, together with 35 lb. of standard sand in each case. Each test was to consist of 2000 mill revolutions, made at about 40 r.p.m. The results obtained are set down in the table below.

	1-in. steel balls	Cylpebs	Holpebs
Weight of charge	300 lb.	300 lb.	224 lb.
Weight of sand used	35 lb.	35 lb.	35 lb.
M.V. ratio, per cent	82.5	78.0	49.0
Total mill revolutions	2000	2000	2000
Speed factor	165	168	165
Hp. supplied (mill friction deducted)	0.612	0.775	0.565
Residue on 180 mesh, per cent.	6.76	10.80	33.60

The original estimate of the relative value of 1 in. balls, cylpebs and holpebs is confirmed by these figures. Using a standard sand curve such as that shown in Fig. 35, the results may be calculated to a residue of 5% on 180 mesh, in each case, as follows:

	1-in. steel balls	Cylpebs	Holpebs
Revolutions to grind to 5% on 180 mesh	2150	2450	4000
Quantity ground per hour, lb.	39.4	35.0	21.2
Hp. per ton ground per hour	34.8	49.5	59.6

The above figures agree reasonably well with the results shown in Figs. 40 and 41 except that the power taken by the 1 in. balls is apparently too low. In the above tests (as previously mentioned) the holpebs are at a disadvantage, since a charge of 300 lb. could not be got into the mill.

(To be continued)

Mississippi Clay Co. Elects Officers and Plans Increased Operations

THE OFFICIALS of the Mississippi Clay Co. at a recent meeting in Charleston, Miss., elected the following officers: L. S. Hemphill, president and general manager; J. W. Saunders, first vice-president and assistant general manager; Ned R. Rice, second vice-president and treasurer; V. D. Hemphill, third vice-president and assistant manager; B. F. Saunders, fourth vice-president and general utility; and H. M. Euart, secretary and manager of glass manufacturing.

The new president and general manager is a well-known gravel man of the South. His home is in Greenwood, where he is president of the Valley Hill Gravel Co. In reporting his election the *Jackson* (Miss.) *Clarion* says: "His reputation is that of a man of extraordinary energy and ability and his record is one of consistent success."

Mr. Saunders, first vice-president and assistant general manager, states that the new president intends to lose no time in building a railroad spur to connect the gravel pits up the valley from Charleston with the Y. & M. V. terminals at Charleston. Mr. Hemphill has been in contact with the state highway commission and it is his purpose to make these gravel deposits available as soon as possible.

Mica Industry in 1931

IN 1931 general conditions in the mica industry in the United States were unfavorable, and compilations of individual reports of producers reveal that the quantity and value of unmanufactured sheet mica marketed in 1931 (including punch, larger than punch, and splittings), were lower than for any year since 1921. Of the ten-year period 1922-1931, inclusive, figures for scrap mica, although showing decreases in both quantity and value in 1931 as compared with 1930, were higher in 1931 than corresponding figures recorded for 1924, 1927 and 1929, the Bureau of Mines reports.

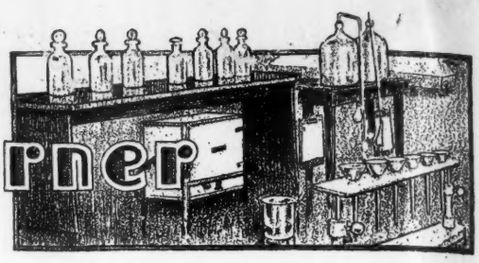
Prices of all grades of sheet mica were lower than those of 1930, and for the first quarter of 1932 show further recessions. Prices of scrap mica in 1931 were not as firm as in 1930, and although the range in value per ton was about the same, the average value per ton was about $1 less than in 1930.

As the new tariff on mica was in effect for only six months of 1930, total imports of mica in 1931 are not strictly comparable with those for 1930. However, in 1931 total imports of unmanufactured mica (General imports) were 4,569,799 lb., valued at $129,827, as compared with 4,555,295 lb., valued at $453,052, in 1930.

Canadian Nonmetallic Minerals in 1931

A PRELIMINARY SUMMARY report on the manufacture of nonmetallic minerals in Canada in 1931 has been made by the Dominion Bureau of Statistics. Of the 15 industries included in the report only the cement products industry and the salt industry showed higher output values than in the next preceding year.

The Chemists' Corner



Comparison of Fineness of Two Series of Cements Ground by Two Different Methods

By Katsuzo Koyanagi
Chichibu Cement Co., Ltd., Tokyo, Japan

THERE ARE TWO PROCESSES of fine grinding of cement: grinding by short mills with air separator and grinding by long mills without air separator. "Which of these two processes is more advantageous?" is one of the most interesting current questions in the cement industry. Some cement engineers insist that the former process is more economical, because for the same degree of fineness tested by standard sieve it consumes less power per barrel of cement, but those who want to manufacture high early strength portland cement mostly prefer the latter process of fine grinding to the former.

The writer conducted fineness tests of cement ground by the two processes, by using standard sieve of 4900 vs. 10,000 meshes to the square centimeter, and the air analyzing apparatus of Mayntz Petersen. The samples of cement were bought in the market. The process of grinding and size of grinding mills were reported upon asking from the works where the tested cements were manufactured.

The diameter of the smallest clinker particle retained on the sieves of 4900 and 10,000 meshes per sq. cm. and air analyzer at the pressure of air current of 70, 50 and 35 mm. is about as shown in the upper table.

The standard sieve test shows that both kinds of cement are of nearly the same fineness, but air analysis shows the latter kinds of cement are actually much finer than the former. This means that the cement ground by long mills without air separator, though it is determined by the standard sieve test to be of the same fineness as the cement by short mills with air separator, does contain a far greater quantity of cement particles finer than 30μ.

The results are shown in the lower tables.

COMPARISON OF SIEVES AND AIR ANALYZER

	Sieve		Air analyzer at the pressure of air current		
	4900/cm.^{2}	10,000/cm.^{2}	70 mm.	50 mm.	35 mm.
Dia. of smallest clinker particle.....	100μ	60μ	50μ	40μ	30μ

CEMENT GROUND BY SHORT MILLS WITH AIR SEPARATOR

Sample No.	Size of mills		Diam. of separator	Fineness of cement: Sieve test. 4900/cm.^{2}	Residue % on 10,000/cm.^{2}	Air analysis: Residue % at the air pressure of 70 mm.	50 mm.	35 mm.
1	7x24 ft.	3-chambered	14 ft.	1.2	5.3	25.2	29.3	33.4
2	7x11 ft.	3-chambered	14 ft.	1.2	9.3	28.8	31.6	37.0
3	7x26 ft.	3-chambered	14 ft.	1.6	5.9	28.0	33.2	37.4
4	7x22 ft.	3-chambered	14 ft.	1.6	7.8	30.1	35.0	38.2
5	7x24 ft.	3-chambered	14 ft.	1.6	8.1	37.8	42.2	52.2
6	7x26 ft.	3-chambered	9 ft.	3.0	9.3	31.4	34.4	38.4

CEMENT GROUND BY LONG MILLS WITHOUT AIR SEPARATOR

Sample No.	Size of mills	Fineness of cement: Sieve test. 4900/cm.^{2}	Residue % on 10,000/cm.^{2}	Air analysis: Residue % at the air pressure of 70 mm.	50 mm.	35 mm.
7	7x36 ft. (3-chambered)	1.0	4.0	17.4	19.0	22.6
8	7x36 ft. (4-chambered)	1.5	4.7	19.4	23.4	27.2
9	7x36 ft. (3-chambered)	1.8	6.12	19.6	24.4	27.0
10	7x36 ft. (4-chambered)	2.5	9.4	24.5	29.8	33.8

Cement No. 1 was reground after air separating again by the second mill of the same length.

From these tests it can be seen how unreliable the standard sieve test is as a measure of the fineness of cement and how important it is to introduce the air analyzing method into the fineness determination of modern portland cement.

Dispute High-Water Mark of Long Island Sound

TRUSTEES of Brookhaven, N. Y., held a meeting on July 28 to map out a fight against the state's claim of ownership of all lands in the harbors of Long Island sound.

The dispute between the state and the town trustees arose when Attorney General Bennett sent a notice to the Great Eastern Sand and Gravel Corp. to stop dredging the harbors of Port Jefferson and Setauket, threatening to get out an injunction if the company did not curtail its activities immediately.

Because the dredging company is operating under leases granted by the town of Brookhaven, the trustees propose to contest the state's right to interfere with the company's operations.

The controversy centers around the question of where the high-water mark of Long Island sound should be drawn. The state claims that the high-water mark is not merely an imaginary line running east and west across the sound, but swings into the harbors too, thereby making all harbor land the property of the state. On the other hand, the trustees insist that the true high-water mark runs outside the harbors and that all the land beneath the indentations of the coast belong to the towns and villages.—*West Hampton Beach* (N. Y.) *Chronicle.*

Reducing the Time Element in Cement Analysis

By G. W. Rhodes

Chemist, Clinchfield Plant, Pennsylvania-Dixie Cement Corp., Clinchfield, Ga.

IT IS GENERALLY CONCEDED that for accurate cement analysis, two evaporations are necessary for the determination of silica. The time required for a complete analysis of cement is at least two days. This element of time has always been a source of great annoyance.

If the iron is determined by the permanganate method, there is considerable delay in the reduction and in the end the result obtained is too high on account of titanium interference. By the use of the Penny or potassium bichromate method the use of an outside indicator is necessary, and this is undesirable. Magnesium determination, like silica, has always caused considerable delay.

A method that will enable the chemist to make a rapid determination of all the elements in cement will be of great benefit. The following discussion has to do with comparatively short methods of determination of silica, iron and magnesium, especially, and will allow a complete analysis in a very short time. These modifications will cut the time from two days to two or three hours.

Silica

H. H. Willard and W. E. Coke[1] recommended perchloric acid as a dehydrating agent for silica on the ground that the silica obtained is purer than when hydrochloric acid is used, and the salts formed are wholly and quickly soluble. The acid, 60 to 70% as sold, can be used directly in dissolving the cement, or added after its solution in another acid. This method of dehydration of silica can be used not only with cement and clinker but also with raw materials after fusing with sodium carbonate.

The method as outlined by Willard and Coke, with a few minor changes, has been tried by the writer with marked success. Care should be taken that dehydration is complete by allowing the sample to remain on the hot plate and evaporate to copious fumes. The time required for this operation is from 10 to 15 minutes.

A number of cement and clinker samples were analyzed by both the evaporation and perchloric methods and the results in every case are in close agreement. It is found that the method can be applied to routine work and will obtain just as accurate results as obtained by the slow process of double evaporation; furthermore permitting a great saving of time. It will be especially valuable in the control of clinker composition and allow two or three analyses a day if necessary.

[1]J. Am. Chem. Soc. 42, 2208 (1920).

Procedure

To 0.5 gram sample in a 150 m.l. casserole add two or three m.l. of water and after mixing to a thin paste add 10 m.l. of perchloric acid. For clay or other raw materials with a high silica content, dissolve the melt in 20 to 30 m.l. of acid. When the sample has dissolved, allow to digest on the hot plate to copious fumes and then boil gently for 10 minutes. Stir the contents of the casserole once or twice during boiling and do not allow the sample to become solid or the separation of silica will be incomplete. Cool the solution for a few minutes and then add 10 m.l. of hot water. Stir thoroughly and filter. Wash the silica first with dilute hydrochloric acid, 1 to 50, and then with hot water. Ignite and weigh. Continue with the analysis for aluminum and lime in the usual manner.

Accuracy

The table below is typical of a number of determinations, showing the close agreement between the two silica methods. Complete analyses of a cement and a clinker are also given to show that the perchloric acid does not interfere with the remainder of the analysis:

TABLE I—TYPICAL DETERMINATIONS

	Cement	
	Evaporation	Perchloric acid
	SiO_2	SiO_2
	21.48	21.42
	21.44	21.44
	.....	21.50
	.....	21.46
	.....	21.48
SiO_2	21.48	21.46
Al_2O_3	6.56	6.46
Fe_2O_3	2.24	2.24
CaO	65.80	65.78
MgO	1.27	1.26
SO_3	1.58	1.58
Loss	1.20	1.20
	Clinker	
	SiO_2	SiO_2
	23.50	23.50
	23.46	23.50
	.....	23.48
	.....	23.40
SiO_2	23.48	23.50
Al_2O_3	5.30	5.30
Fe_2O_3	2.54	2.54
CaO	67.27	67.20
MgO	1.26	1.22

Iron

Another improvement is the iron determination. The method used at this laboratory is a modification of the Penny method, and this analysis can be carried along with the main determinations. This method uses diphenylamine as an inside indicator. C. B. Core reported this in *Chemist Analyst*, Vol. 20, No. 3, May, 1931, but it will bear repeating for the benefit of any who may be unfamiliar with the procedure. To a one gram sample add 15 m.l. of water and 20 m.l. of 1 to 1 hydrochloric acid. After solution is effected, dilute to 100 m.l. and bring to boil. Reduce the iron with $SnCl_2$ and cool rapidly. It is unnecessary to filter off any silica that may separate. When cool add 10 m.l. of a saturated solution of $HgCl_2$ and allow to stand for several minutes. Add 20 m.l. of the retarder solution and three drops of the indicator and titrate with potassium bichromate.

As the end point approaches, the solution changes from a green to a blue green. Continue the titration carefully until an intense violet blue color is reached. This is the end point. It is an unusually sharp end point and cannot be mistaken when once the analyst has detected the color. The best results are obtained if the solution to be titrated ranges from 100 m.l. to 200 m.l.

The retarder is made by mixing 150 m.l. of conc. sulphuric acid and an equal amount of phosphoric acid and diluting to 1000 m.l. with distilled water. The indicator is made by dissolving one gram of diphenylamine in 100 m.l. conc. sulphuric acid. The indicator is very stable and will last for months.

This laboratory formerly used the permanganate method but changed to the above method for the sake of accuracy and speed. The iron as determined by the permanganate method is greater than that obtained by the bichromate method. The difference in the two methods is a close indication of the titanium present. This well known fact has been confirmed by work done in one of the laboratories of the Pennsylvania-Dixie Cement Corp.

Table No. II shows the results obtained on eight different samples by both methods, the difference and the determined titanium:

TABLE II—COMPARISON OF METHODS

Sample No.	Titration method $KMnO_4$	Titration method $K_2Cr_2O_7$	Difference	Determined titanium
1	3.38	3.16	0.22	0.27
2	3.48	3.16	0.32	0.32
3	3.34	3.16	0.18	0.24
4	3.50	3.11	0.39	0.32
5	3.59	3.31	0.28	0.28
6	3.59	3.36	0.23	0.26
7	3.59	3.31	0.28	0.28
8	3.54	3.26	0.28	0.24

Reported by M. L. Silcox, chemist, Des Moines plant, Pennsylvania-Dixie Cement Corp.

Magnesium

A method for a rapid determination of magnesium, by F. P. Denier, is given in the Mill Section of *Concrete*, Vol. 39, December, 1931. The author claims that by the use of this method it is possible to make the magnesium determination in 30 minutes.

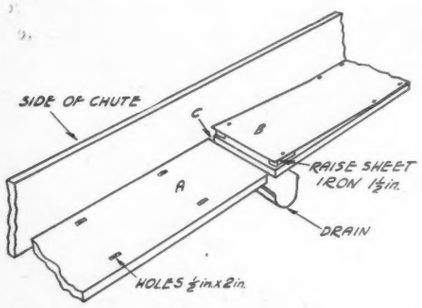
In the Diener method the iron and aluminum are precipitated by the addition of calcium carbonate. Any manganese may be removed by potassium permanganate and the excess permanganate reduced by boiling with ethyl alcohol. Magnesium is then precipitated with standard carbonate free alkali solution and the excess alkali titrated with standard acid solution.

Hints and Helps for Superintendents

Drain for Dewatering Rock Chute

By Dare Paris
Monrovia, Calif.

WHERE crushed stone and gravel is washed and spouted from the screens into the bunkers below there is always more or less water in the chute which



Gap in chute drains water from stone

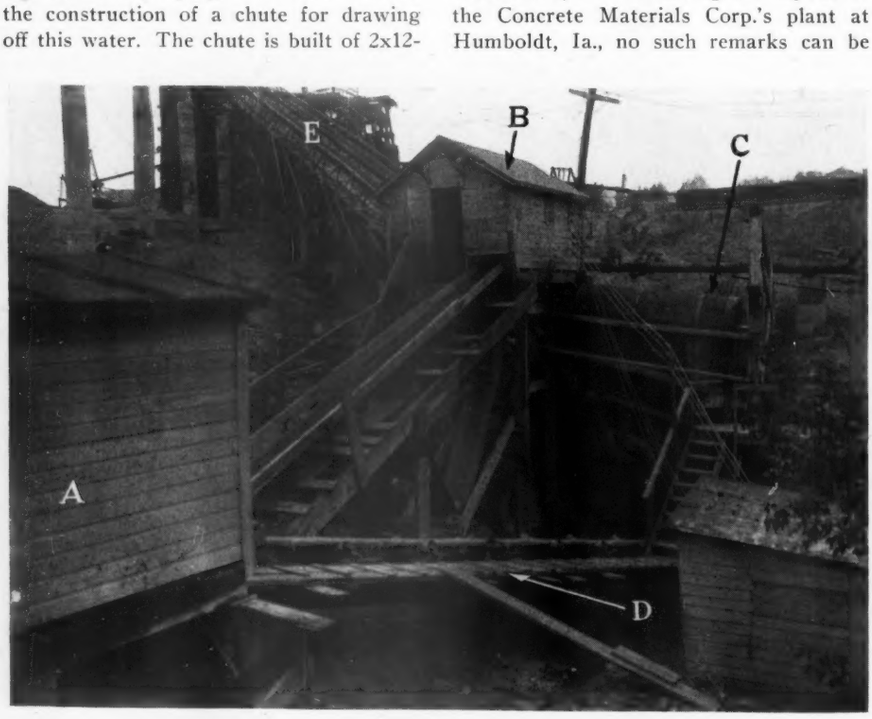
keeps dripping in the bunkers, often spoiling the appearance and cleanliness of the stone. This is especially true when the bunkers are low.

The accompanying illustration shows the construction of a chute for drawing off this water. The chute is built of 2x12-in. planks. A space 2 in. wide is cut out of the bottom which is then lined with sheet iron, leaving the 2-in. space open. Note how holes are cut in the lower sheet. This is to facilitate adjusting of space at C according to the slope of the chute and the speed of the rock coming down. The upper sheet of iron is raised 1½ in. above the lower sheet. This enables the stone to pass over the space, while the water clings to the iron bottom when it comes to the opening and is carried off in the drain chute.

Compact Scalping Operation

WHERE a sand and gravel operation calls for a scalping screen and a return of the oversize from that screen to the primary crusher it often seems necessary to have long inclined belt conveyors for this purpose, and in many cases these are strung out to considerable length. Such expressions as "they sure drag their material around plenty," or "they must think that the gravel likes to ride," are often heard.

However, in considering the layout of the Concrete Materials Corp.'s plant at Humboldt, Ia., no such remarks can be made, for the work under discussion is done in about as compact a unit as one can find in many days' travel. In the illustration (*A*) is the primary and only crusher, (*B*) is the housing over the drive for the scalper screen, (*C*) is the scalper screen, (*D*) the return belt and (*E*) the main belt serving the classifying screens. The whole arrangement obviously requires a minimum of belt and so located that inspection is effortless.

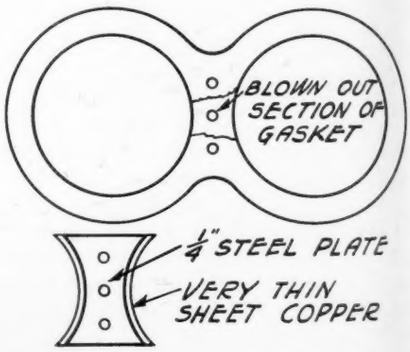


Scalping screen is located to keep conveying costs low

Gasket for Two Cylinders with One Cylinder Head

By C. H. Wright
Snyder, N. Y.

TO PREVENT blowing out of gaskets between cylinders where two cylinders are used in one unit with one cylinder head, as shown in an accompanying illustration, the following method has proved quite satisfactory.



How gaskets may be reinforced

Take a piece of very thin copper. Anneal it to a workable degree by heating it until it takes a noticeable change in color, then dip quickly in cold water. Cut the copper slightly larger than the required gasket at the point between the two cylinders. Fit it in place. Over this put the regular gasket which has been used in the past. Then bend the edge of the copper gasket up over the fiber gasket.

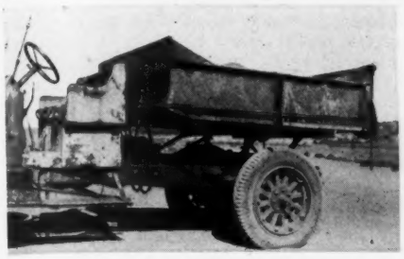
In order to get a satisfactory job cut out a piece of ¼-in. steel plate the shape of the casting between the cylinders where the gasket blows out. Tighten this down very firmly and flange down the copper with a light machine hammer. Then remove the steel plate and finish

flanging down the copper gasket. The cylinder head can then be replaced and you can know the gasket is there to stay.

Gravity Dump Body for Truck

By Ernest Moyer
Alturas, Calif.

ON OUR 1924 model Graham truck the wood hand-dump body was no longer serviceable, but the truck itself was still good for many miles of use for our miscellaneous hauling requirements, while its trade-in value was negligible. So we replaced the old dump body with an arc welded one, as shown in accompanying illustrations.



Truck with gravity dump

The advantage gained by this type of dump is that it moves the body of the truck to the rear of the chassis while dumping, making it possible to lower the center of gravity of the loaded truck without sacrificing the degree of dumping that would be necessary with a fixed hinge point when gravity is the dumping force.

With the design shown, if the load is at the center of the body, or to the rear of the truck, it is self-dumping when the latch at the front is tripped. If the load is forward the chain with winding shaft is used. This requires little effort unless the load is well in the front of the truck.

The body size of the truck is 6 ft. by 7 ft. by 16 in. deep (56 cu. yd.) which is a convenient size under the ¾-yd. shovel. We have also used it a lot in the pit to help out the 5-yd. truck.

Close-up of dumping quadrant

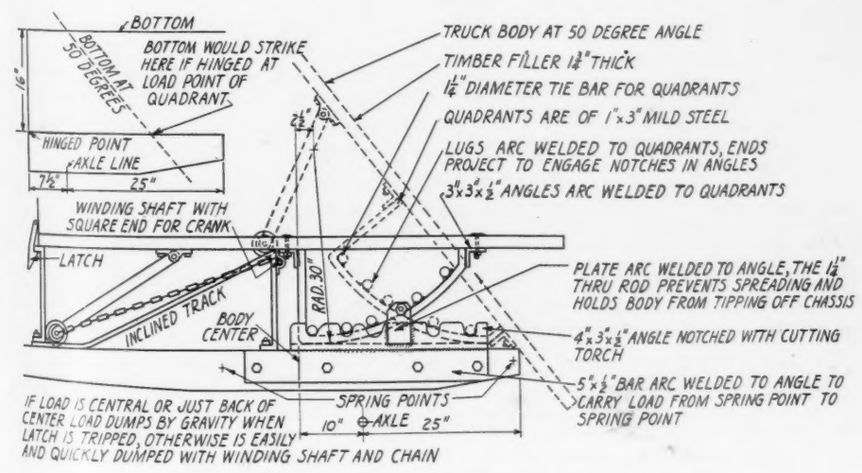
Fabrication of the complete body and dumping device was simplified by the use of arc welding, which was used in many parts of the work.

Tinning Bearing Shells

AS A RULE a better and more serviceable bearing job will result if the shell is tinned before the bearing metal is poured. This gives a better bond, makes it unnecessary to peen and makes it possible for the bearing to wear very thin without cracking. The tinning mixture requires a specially treated shell but this is not difficult to prepare. With bronze shell the tinning is sufficient anchor for the babbitt. This is also true for small steel or iron shells but the larger ones of this type usually require some additional anchors such as grooves. Tinning does, however, improve the service life of all type shells, anchors or no anchors.

The shell should be thoroughly cleaned of old babbitt, scale, oil and sand. The babbitt and oil can be melted and burned out with a torch or with a bath of molten metal. The ferrous shell can be thoroughly cleaned by pickling in a solution of muriatic acid, 1 part in 10 by volume. The surface should then be filed or sandpapered. The shell is then ready for tinning.

The flux is made of one part of zinc dissolved in three parts of commercial hydrochloric (muriatic) acid by weight. The tinning alloy is made half tin and half lead and can best be used in bar form, although with much work the molten metal is handier. The shell should then be heated and parts which are not to be tinned swabbed with a mixture of graphite in water, while the remaining parts are swabbed with the flux. The tinning alloy is then rubbed on and the shell should be hot enough so that it will melt and run freely although a hot iron will help cover the spots. Rubbing with a rag will give an even surface. Babbitting immediately without cooling is preferable. If the shell is tinned in a bath of molten alloy the surface should not be touched after taking from the pot and before pouring the babbitt. Tinning takes but a few minutes' time, is no bother if the fluxing and alloy are on hand and pays big dividends.


BOTTOM
BOTTOM AT 50 DEGREES
BOTTOM WOULD STRIKE HERE IF HINGED AT LOAD POINT OF QUADRANT
HINGED POINT
AXLE LINE
7½"
25"
WINDING SHAFT WITH SQUARE END FOR CRANK
LATCH
INCLINED TRACK
BODY CENTER
RAD. 30"
2½"
TRUCK BODY AT 50 DEGREE ANGLE
TIMBER FILLER 1¼" THICK
1¼" DIAMETER TIE BAR FOR QUADRANTS
QUADRANTS ARE OF 1"x3" MILD STEEL
LUGS ARC WELDED TO QUADRANTS, ENDS PROJECT TO ENGAGE NOTCHES IN ANGLES
3"x3"x½" ANGLES ARC WELDED TO QUADRANTS
PLATE ARC WELDED TO ANGLE, THE 1¼" THRU ROD PREVENTS SPREADING AND HOLDS BODY FROM TIPPING OFF CHASSIS
4"x3"x½" ANGLE NOTCHED WITH CUTTING TORCH
5"x½" BAR ARC WELDED TO ANGLE TO CARRY LOAD FROM SPRING POINT TO SPRING POINT
SPRING POINTS
10"
AXLE
25"
IF LOAD IS CENTRAL OR JUST BACK OF CENTER LOAD DUMPS BY GRAVITY WHEN LATCH IS TRIPPED, OTHERWISE IS EASILY AND QUICKLY DUMPED WITH WINDING SHAFT AND CHAIN

Showing details of design of plant built truck dump

Handy Bin Spout Adjuster

AT THE NEW central mixed concrete plant of the Warner Co., in Morrisville, N. J., the various aggregates are delivered to the plant by a long inclined belt conveyor. The belt discharges to a group of bins arranged around a central

Hand winch at lower left

circular bin. The center bin, or tank, holds water for the mix.

To make it conveniently possible for the operator to deliver aggregate to any desired bin a swivelled spout has been arranged above the bins which is controlled by cables and a small hand winch. The hand winch is located near the foot of the incline on the ground level.

The wire cable connecting the winch and the spout has a marker attached to it in such a manner that the ground operator can tell at a glance just where he is spotting the movable spout. The illustration shows how the winch and marker are mounted on one of the legs of the take-up pulley supports.

How New York State Producers Are Fighting Gas Tax Diversion

The New York State Construction Council in Action

AS WE HAVE NOTED in previous issues of Rock Products, New York state producers and contractors are actively engaged in fighting the diversion of gasoline and motor-vehicle license tax money. They are doing it through the New York State Construction Council, Inc., of which Harold V. Owens, president of the Eastern Rock Products, Inc., is chairman of the executive committee. Tom Wright is executive secretary, Rochester, N. Y.

Under the auspices of the Council a large and enthusiastic meeting was recently held at Buffalo, N. Y. About 50 representative business men attended, including contractors, investment bankers, automotive industry executives, as well as road material and machinery manufacturers. A proposal to limit the gasoline tax to 2 c. per gal. and prevent any diversion by law was enthusiastically received. Similar meetings will be held in other parts of the state in the near future. Prospective candidates for the legislature are being interviewed and asked to declare themselves on the issue of gas tax diversion.

As the New York State Construction Council, Inc., is a carefully worked out organization for a specific purpose, to meet an issue that is common to producers in nearly every other state, its constitution and outline of activities should be not merely of interest but of practical value to every Rock Products reader who sells material for highway construction, directly or indirectly.

New York State Construction Council, Inc.—Membership, Purpose, Principles and Activities

MEMBERSHIP

The membership is composed of such individuals and organizations in the state of New York as are interested first, in fair and reasonable taxation; second, in sensible and economical public works policies, and third (at this particular time) in the proper distribution and expenditure of revenues from road taxes.

The Council was organized by producers and distributors of materials, machinery and supplies used in construction work, and by contractors prosecuting such work. These parties subscribe to the purpose and principles hereafter set forth, and agree that the activities of the Council shall be in strict accordance with such purpose and principles.

PURPOSE

Insofar as their activities and markets deal with public works construction, the members of this Council are engaged in a public service industry.

The business interests of the Council's members will be served best through the medium of a public works program designed to give maximum return to the public and fitted to the taxpayers easy ability to pay.

The purpose of this Council is to further, by every fair and legitimate means in its power, the inauguration and prosecution of such a public works policy.

The principles and activities outlined herewith we believe to be consistent with this purpose.

PRINCIPLES

(a) Public works are paid for by the public and are for the public benefit. Public works construction, unless dictated by the needs of public health or other welfare necessities, should be least active during periods of general business prosperity. It should be most active during periods of business depression as a medium of unemployment relief and general business stimulation.

(b) Motor vehicle and motor fuel taxes were conceived and imposed to provide and maintain improved highways for the use of motor vehicles. They are road taxes in improved and equitable form. Since their imposition all expense of constructing and maintaining state and county highways in New York state, except interest and amortization of the balance of the original $100,000,000 road bond issues, has been paid out of revenues from these taxes. All state and county highway expense, including interest and amortization of the old bonds, should be paid from these revenues, absolutely relieving other sources of taxation.

(c) From such revenues there should be set aside annually a substantial amount for the purpose of maintaining farm-to-market roads of the feeder type.

(d) Provision should be made to set aside from these revenues annually, during periods of business prosperity, a substantial sum to be used as a sinking fund; this fund to be used to carry out augmented highway programs during periods of business depression.

(e) Rates of motor vehicle and motor fuel taxation should be adjusted to yield annually such a total sum as is necessary to meet the above requirements; refund to New York City and to the counties 25% of the total revenue as provided in the laws of 1929; provide funds to be expended directly by the State Highway Department for maintenance and patrol of existing roads, and leave a balance sufficient to carry on a normal program of construction and reconstruction.

(f) Such taxes in amounts which will return revenues in excess of these requirements are wrong.

(g) Diversion of any part of the revenues from such taxes for any other uses whatsoever is unfair to motor vehicle owners; constitutes class taxation; is contrary to the theory and purpose of these taxes; tends to encourage and conceal extravagance in other departments of government, and in New York state is in direct violation of the laws made when these taxes were instituted in 1929 and to promises made to the motorists at that time.

(h) The proceeds from a 2 c. per gal. gasoline tax plus those from the original motor vehicle tax are sufficient to meet all such highway requirements in New York state.

(i) Disposition of revenues from motor vehicle and motor fuel taxes should be fixed for highway uses only by an amendment to the New York state constitution.

(j) Authority for the determination of a sane and far-sighted policy and program of public works construction in New York state should be vested in a Public Works Commission, composed of men qualified by education and experience to consider and pass upon the technical, economic and welfare aspects of a state-wide public works policy.

PROPOSED ACTIVITIES

(1) To promote, in New York state, a sane and far-sighted policy of public works construction planned by the decade rather than by the year and with sufficient flexibility to meet current economic conditions as such may occur.

(2) To promote a better understanding of the value of public works between those engaged directly and indirectly in their prosecution and the public which provides the necessary funds; this to be done by acquainting the public with the true facts pertaining to all matters connected with the public works construction industry.

(3) To strive, as a major and particular object of its organization and existence, against diversion of gasoline tax and motor license tax revenues to any uses whatsoever other than the maintenance, reconstruction and construction of highways, for which purposes these taxes were originally conceived and to which purposes the revenues to be derived therefrom were definitely limited by legislative enactments in 1929.

(4) To study and sponsor sane and constructive methods of expending the funds derived from gasoline and motor vehicle taxes and to consult and advise with legislative and other lawmaking bodies or committees thereof, relative to the expenditure of such funds.

(5) To cooperate with other organizations of this state, with those of other states, and with those national in their scope the aims and objects of which organizations are similar to those of this Council.

(6) To consider the possibilities of public works programs as a means of meeting the problems of unemployment relief and to prepare recommendations to legislative bodies and to unemployment relief committees.

(7) To maintain the standards of the industry at the level necessitated by its semi public service character.

(8) To actively support, in an absolutely non-partisan manner, candidates for public office who declare themselves in accord with the above purpose and principles and pledge their efforts toward furthering same.

Reports on Federal Trade Commission Investigation

THE assembling of material in the investigation of competitive conditions in the cement industry by the Federal Tax Commission is reported to be well under way.

In its investigation of building material prices on federal contracts it is said considerable progress has been made in preparing a report.

Publishes Data on Relief Legislation and Effect on Construction

THE Universal Atlas Cement Co., Chicago, Ill., has published a review of the $2,000,000,000 Federal Emergency Relief and Construction Act as passed by the last Congress, as well as the act in full. This literature is being distributed to those who may find use for the information contained.

Editorial Comment

Controlled Production

One industry after another is experiencing the fact that there can be no lasting peace or prosperity in an industry without some control of production. Under our present anti-trust laws, and what is more important, under our American conceptions of equality of opportunity and individual responsibility, there can be no legal agreements among competitors to limit production. There is said to be no instance in industrial history where such agreements have been entered into, legal or otherwise, that solved the problem of control of production satisfactorily over any considerable period of time.

In the last analysis, the success of industry, as the success of a democracy or a republic, depends on the aggregate intelligence and tolerance of its individual members. Such experience as industry has had in the last two or three years goes farther to promote such intelligence and tolerance than all the precepts and laws ever written. The problem of industry and of society is to profit from such experience in as permanent a manner as possible, so that the lesson need not be repeated too frequently.

According to a study by the United States Department of Commerce, one of the principal causes of business failures in this free-for-all country of ours comes under the head of "unjustified entrance into the business." Some things that make an entrance into any business unjustified are lack of capacity, training and experience, incompetence, insufficient capital, poor location, too high overhead, etc. But who is going to determine whether there is justification or not? Few business men want to see the power or authority for such a momentous decision put into the hands of a politically elected or appointed commission or board. Few business men really believe the members of an industry can be sufficiently unbiased or unselfish to make just decisions for their own industry. Of course the only answer is that such decisions must be made directly or indirectly by an enlightened public which holds the purse strings.

How then can public opinion become more enlightened? The only suggestion we can make is by presenting facts that will enlighten the public, and by preventing or nullifying the publication of statements or figures which are untrue or intended to be misleading. Unquestionably our laws governing the incorporation of new enterprises and the permission to solicit capital from the public should be more strict; but on the other hand legitimate business has powerful weapons which need only the exercise of a little more real "guts" to make very effective. We mean the various local "better business bureaus," Rotary Clubs, and similar organizations designed to promote civic welfare.

To make our point more clear and specific we will take the case of cement plant promotion at the present time. The proposed plant is in a section of the country already studded with plants, many closed and none working to anything like capacity. The prospectus starts out with the old formula, "the investor seldom has an opportunity of acquiring cement stock." This of course is too obviously untrue to require any refutation to Rock Products readers, but it is typical of the entire prospectus.

We might go on at length to quote misleading statements and other obvious untruths from this prospectus, but it is typical and doubtless all our readers are quite familiar with such documents. It is not for Rock Products to say that a new plant in this industry in that or any other locality is not necessary. It can say, however, that to obtain capital for such a plant by such statements as those quoted comes very close to obtaining money under false pretenses.

It seems to us the ideal way to combat such promotions is to get together a local committee from the better business bureaus, civic organizations, bankers, etc., composed of broad-gage, public-spirited citizens who would take upon themselves the responsibility of making a thoroughgoing investigation and analysis of the claims made by the promoter, with unlimited authority to report their findings to the local business and civic organizations, newspapers, etc. The members of the industry involved might well finance such an investigation, but the committee of course should be entirely free to arrive at an independent and unbiased conclusion. Outside experts could be employed to determine and assemble the facts so that local sentiment or feeling need not in any way enter into the picture.

It is assumed that every community is anxious to add to its industries and to give its residents every opportunity to participate in its profits. We have all too many examples of community interest, enthusiasm and enterprise along this line. But can't it also be assumed that every community is also anxious to protect its going industries from ruinous and unnecessary competition and its residents from confidence men operating under the guise of *new* business promoters?

We believe a proper approach to this problem in every community will result in a new conception of civic duty and a new conception of our individual responsibilities as business men and citizens. It goes without saying, almost, that the established manufacturers in an industry should be prepared to accept an unbiased report, and that sometimes perhaps such a report will show up some of their own shortcomings too. But if they are right minded about their industry and the welfare of their community they can profit as much from an adverse report as from a favorable one.

We hope the time will soon come when failure of such a committee to act of its own initiative in a case of this kind will be considered by the public a serious lapse in the civic responsibilities of its leading citizens. The public can be educated to such a viewpoint if we as business men assume our own responsibility of conducting business with a decent regard for the interests of the public.

Financial News and Comment

RECENT QUOTATIONS ON SECURITIES IN ROCK PRODUCTS CORPORATIONS

Stock	Date	Bid	Asked	*Dividend
Allentown P. C. 1st 6's[27]	8-24-32	No market		
Alpha P. C. com.[2]	8-22-32	6½	8	25c qu. Apr. 25
Alpha P. C. pfd.[2]	8-22-32	60	80	1.75 qu. June 15
Amalgamated Phosphate Co. 6's, 1936[19]	8-18-32	89	93	
American Aggregates com.[19]	8-18-32	1	3	
American Aggregates pfd.[19]	8-18-32	5	15	1.75 qu. Jan. 1
Amer. Aggr. 6's, w.w.[19]	8-18-32	35	39	
Amer. Aggr. 6's, ex.w.[19]	8-18-32	33	37	
Amer. L. & S. 1st 7's[27]	8-24-32	50	.....	
American Silica Corp. 6½'s[39]	8-23-32	No market		
Arundel Corp. com.	8-22-32	19 actual sale		75c qu. July 1
Bessemer L. & C. Class A[4]	8-19-32	.....	2	
Bessemer L. & C. 1st 6½'s[4]	8-19-32	15½	.....	
Bloomington Limestone 6's[27]	8-24-32	No market		
Boston S. & G. new com.[37]	8-18-32	3	5	5c qu. July 1
Boston S. & G. new 7% pfd.[37]	8-18-32	20	30	87½c qu. July 1
Boston S. & G. 7's, 1934[19]	8- 1-32	55	60	
California Art Tile, A	8-18-32	1½	4¼	
California Art Tile, B[9]	8-18-32	.....	4	
Calaveras Cement com.	8-17-32	.....	3⅛	
Calaveras Cement 7% pfd.[9]	8-17-32	.....	65	1.75 qu. July 15
Canada Cement com.	8-22-32	4⅞	5	
Canada Cement pfd.	8-22-32	36	38	1.62½ qu. June 30
Canada Cement 5½'s[42]	8-22-32	81	85	
Canada Crushed Stone bonds[42]	8-22-32	64	70	
Canada Crushed Stone com.[42]	8-22-32	No market		
Certainteed Products com.	8-22-32	2¾	2⅞	
Certainteed Products pfd.	8-22-32	6½	18⅝	1.75 qu. Jan. 1
Certainteed Products 5½'s	8-22-32	45 actual sale		
Cleveland Quarries	8-23-32	.....	40	10c qu. Sept. 1
Consol. Cement 1st 6½'s, A[44]	8-23-32	5	10	
Consol. Cement notes, 1941[27]	8-24-32	No market		
Consol. Cement pfd.[27]	8-24-32	No market		
Consolidated Oka Sand and Gravel (Canada) 6½'s[12]	8-19-32	50	60	
Consolidated Oka Sand and Gravel (Canada) pfd.[42]	8-22-32	No market		
Consol. Rock Prod. com.[35]	8-18-32	5c	15c	
Consol. Rock Prod. pfd.[35]	8-18-32	40c	60c	
Consol. S. & G. pfd. (Can.)	8-22-32	.....	50	50c qu. Aug. 15
Construction Mat. com.	8-23-32	¼	3	
Construction Mat. pfd.	8-23-32	3½	4	
Consumers Rock and Gravel, 1st Mtg. 6's, 1948[35]	8-18-32	28	33	
Coosa P. C. 1st 6's[23]	8-18-32	14	.....	
Coplay Cem. Mfg. 1st 6's[19]	8-18-32	48	52	
Coplay Cem. Mfg. pfd.[47]	8-23-32	6	10	
Dewey P. C. com.[47]	8-23-32	75	85	
Dolese and Shepard	8-22-32	14	16	$1 qu. Jan. 1
Dufferin Pav. & Cr. Stone pfd.	8-22-32	.....	27	1.75 qu. Apr. 1
Dufferin Pav. & Cr. Stone com.	8-22-32	.....	5	
Edison P. C. com.[47]	8-23-32	3	5	
Federal P. C. 6½'s[10]	8-18-32	35	40	
Giant P. C. com.[47]	8-23-32	1	2	
Giant P. C. pfd.[47]	8-23-32	4	6	
Gyp. Lime & Alabastine, Ltd.	8-22-32	3¾	4	
Gyp. Lime & Alabastine 5½'s[42]	8-22-32	55	60	
Hermitage Cement com.[11]	8-20-32	3	6	
Hermitage Cement pfd.[11]	8-20-32	20	30	
Ideal Cement 5's, 1943[29]	8-20-32	80	85	
Ideal Cement com.	8-22-32	8	11	50c qu. July 1
Indiana Limestone units[27]	8-23-32	No market		
IndianaLimestone 6's	8-20-32	9 actual sale		
International Cem. com.	8-22-32	11½	11¾	50c qu. Mar. 31
International Cem. bonds, 5's	8-22-32	69 actual sale		Semi-ann. int.
Kelley Island L. & T.	8-23-32	10⅛	11	25c qu. July 1
Ky. Cons. Stone com.	8-22-32	.....	2	
Ky. Cons. Stone pfd.	8-22-32	.....	50	
Ky. Cons. St. 1st Mtg. 6½'s	8-22-32	10	15	
Ky. Cons. St. V. T. C.[45]	8-19-32	1	2	
Ky. Rock Asphalt com.	8-22-32	.....	2½	
Ky. Rock Asphalt pfd.	8-22-32	.....	25	
Ky. Rock Asphalt 6½'s	8-22-32	57	62½	
Lawrence P. C.[3]	8-22-32	6	.....	
Lawrence P. C. 5½'s, 1942[2]	8-22-32	30	35	
Lehigh P. C. com.	8-22-32	8	9	
Lehigh P. C. pfd.	8-22-32	52	90	1.75 qu. Oct. 1
Louisville Cement[7]	8-18-32	60	80	
Lyman-Richey 1st 6's, 1935[13]	8-19-32	85	95	
Marblehead Lime 6's[14]	8-19-32	No market		
Marbelite Corp. com.[35] (cement products)	8-18-32	5c	75c	
Marbelite Corp. pfd.[35]	8-18-32	50c	.....	
Marquette Cement com.[47]	8-23-32	3½	5	
Marquette Cement pfd.[47]	8-23-32	48	52	1.50 qu. July 1
Marquette Cem. Mfg. 1st 5's, 1936[46]	8-23-32	75	.....	
Marquette Cem. Mfg. 1st 6's, 1936[46]	8-23-32	80	.....	
Material Service Corp.	8-22-32	4	11	
McCrady-Rodgers 7% pfd.[22]	8-18-32	30	35	87½c qu. June 30
McCrady-Rodgers com.[22]	8-18-32	5	10	75c qu. Jan. 26
Medusa P. C. pfd.[47]	8-23-32	40	50	1.50 qu. Apr. 1
Medusa P. C. com.	8-23-32	6	7½	
Monarch Cement com.[47]	8-23-32	55	60	
Michigan L. & C. com.[6]	8-20-32	45	.....	
Missouri P. C.	8-22-32	.....	9	25c qu. Jan. 30
Monolith Portland Midwest com.[35]	8-18-32	20c	30c	
Monolith Portland Midwest pfd.[35]	8-18-32	.....	1	
Monolith P. C. com.[9]	8-18-32	60c	90c	40c s.-a. Jan. 1
Monolith P. C. pfd.[9]	8-18-32	1	1¼	40c s.-a. Jan. 1
Monolith P. C. units[9]	8-18-32	2¼	3¼	
Monolith P. C. 1st Mtg. 6's[9]	8-18-32	35	40	
National Cem. (Can.) 1st 7's[27]	8-24-32	80	90	
National Gypsum A com.[27]	8-23-32	.....	2	
National Gypsum pfd.	8-23-32	27	30	1.75 qu. July 1
National Gypsum 6's[3]	8-23-32	60	.....	
National L. & S. 6½'s, 1941[19]	8- 1-32	70	75	
Nazareth Cem. com.[25]	8-18-32	2	.....	
Nazareth Cement pfd.[35]	8-18-32	25	.....	
Newaygo P. C. 1st 6½'s[27]	8-24-32	80	90	
N. Y. Trap Rock 1st 6's	8-22-32	68 actual sale		
N. Y. Trap Rock 7% pfd.[27]	8-24-32	.....	60	1.75 qu. July 1
North Amer. Cem. 1st 6½'s	8-22-32	30 actual sale		
North Amer. Cem. com.[48]	8-22-32	.....	3	
North Amer. Cem. 7% pfd.[48]	8-22-32	1	.....	
North Shore Mat. 1st 6's[15]	8-23-32	.....	35	
Northwestern States P. C.[47]	8-23-32	25	29	
Ohio River S. & G. com.	8-22-32	.....	8	
Ohio River S. & G. 7% pfd.	8-22-32	.....	98	
Ohio River S. & G. 6's[16]	8- 6-32	35	60	
Oregon P. C. com.[9]	8-18-32	8	12	
Oregon P. C. pfd.[9]	8-18-32	80	85	
Pacific Coast Aggr. com.[40]	8-18-32	.....	1	
Pacific Coast Aggr. pfd.[40]	8-18-32	.....	1½	
Pacific Coast Aggr. 6½'s, 1944[5]	8-18-32	10	12	
Pacific Coast Aggr. 7's, 1939[9]	8-18-32	2	4	
Pacific Coast Cement 6's[5]	8-18-32	42	.....	
Pacific P. C. com.[5]	8-18-32	2	4	
Pacific P. C. pfd.[5]	8-18-32	28	32	1.62½ qu. July 5
Pacific P. C. 6's, 1934	8-17-32	80	.....	
Pacific P. C. 6's, 1935	8-17-32	.....	94	
Pacific P. C. 6's, 1936	8-17-32	72	94	
Peerless Cement com.[21]	8-19-32	25c	75c	
Peerless Cement pfd.[21]	8-19-32	4	8	
Penn.-Dixie Cement com.	8-20-32	1⅜	1½	
Penn.-Dixie Cement pfd.	8-20-32	5¼	12	
Penn.-Dixie Cement 6's	8-22-32	50 actual sale		
Penn. Glass Sand Corp. pfd.[27]	8-24-32	40	50	1.75 qu. Apr. 1
Penn. Glass Sand Corp. 6's[19]	8-18-32	70	.....	
Petoskey P. C.	8-22-32	1¼	1½	
Port Stockton Cem. com.[9]	8-18-32	No market		
Riverside Cement com.[9]	8-18-32	.....	10	
Riverside Cement pfd.[9]	8-18-32	38	42	1.50 qu. Aug. 1
Riverside Cement, A[9]	8-15-32	4	6	
Riverside Cement, B[9]	8-18-32	70c	1	
Roquemore Gravel 6½'s[17]	8-20-32	75	.....	
Sandusky Cement 6¼'s, 1932-37[27]	8-24-32	70	80	
Santa Cruz P. C. com.	8-17-32	45	65	$1 qu. July 1
Schumacher Wallboard com.	8-17-32	1	.....	
Schumacher Wallboard pfd.	8-17-32	3	.....	50c qu. May 15
Signal Mt. P. C. pfd.[47]	8-23-32	2	5	
Southwestern P. C. units[35]	8-18-32	150	200	
Southwestern P. C. pfd.[47]	8-23-32	70	75	$2 qu. July 1
Standard Paving & Mat. (Canada) com.	8-22-32	1½	1¾	
Standard Paving & Mat. pfd.	8-22-32	.....	28	50c qu. Aug. 15
Superior P. C., A[9]	8-18-32	23	25	27½c mo. Sept. 1
Superior P. C., B[9]	8-18-32	4	6	12½c July 20
Trinity P. C. units[47]	8-23-32	33	36	
Trinity P. C. com.[47]	8-23-32	5	8	
Trinity P. C. pfd.[47]	8-23-32	30	35	
U. S. Gypsum com.	8-22-32	22	22½	40c qu. Oct. 1
U. S. Gypsum pfd.	8-22-32	97	100	1.75 qu. Oct. 1
Wabash P. C.[21]	8-19-32	3	7	
Warner Co. com.[16]	8- 6-32	2	2½	
Warner Co. 1st 7% pfd.[16]	8- 6-32	15	30	1.75 qu. Apr. 1
Warner Co. 6's, 1944, with war.	8-19-32	35	50	
Whitehall Cem. Mfg. com.[30]	8-19-32	.....	80	
Whitehall Cem. Mfg. pfd.[30]	8-19-32	.....	55	
Wiscon. L. & C. 1st 6's, '33[15]	8-23-32	35	.....	
Wolverine P. C. com.	8-22-32	½	1	
Yosemite P. C. A. com.[9]	8-18-32	90c	1.10	

*Latest 1932 dividend.

Quotations by: [1]Watling Lerchen & Hayes Co., Detroit, Mich. [2]Bristol & Willett, New York. [3]Rogers, Tracy Co., Chicago. [4]Butler, Wick & Co., Youngstown, Ohio. [5]Smith, Camp & Riley, San Francisco, Calif. [6]Frederick H. Hatch & Co., New York. [7]J. J. B. Hilliard & Son, Louisville, Ky. [8]Dillon, Read & Co., Chicago, Ill. [9]A. E. White Co., San Francisco, Calif. [10]Lee Higginson & Co., Boston and Chicago. [11]J. W. Jakes & Co., Nashville, Tenn. [12]James Richardson & Sons, Ltd., Winnipeg, Man. [13]Stern Bros. & Co., Kansas City, Mo. [14]First Wisconsin Co., Milwaukee, Wis. [15]Central-Republic Bk. & Tr. Co., Chicago. [16]G. M. P. Murphy & Co., Baltimore, Md. [17]Citizens Southern Co., Savannah, Ga. [18]Dean, Witter & Co., Los Angeles, Calif. [19]Hewitt, Ladin & Co., New York. [20]Tucker, Hunter, Dulin & Co., San Francisco, Calif. [21]Baker, Simonds & Co., Inc., Detroit, Mich. [22]Peoples-Pittsburgh Trust Co., Pittsburgh, Penn. [23]Howard R. Taylor & Co., Baltimore. [24]Richards & Co., Philadelphia, Penn. [25]Hincks Bros. & Co., Bridgeport, Conn. [26]Bank of Republic, Chicago, Ill. [27]National City Co., Chicago, Ill. [28]Chicago Trust Co., Chicago, Ill. [29]Boettcher-Newton & Co., Denver. [30]Hanson and Hanson, New York. [31]S. F. Holzinger & Co., Milwaukee, Wis. [32]Tobey and Kirk, New York. [33]Steiner, Rouse and Co., New York. [34]Jones, Heward & Co., Montreal, Que. [35]Tenney, Williams & Co., Los Angeles, Calif. [36]Stein Bros. & Boyce, Baltimore, Md. [37]Wise, Hobbs & Arnold, Boston. [38]E. W. Hays & Co., Louisville, Ky. [39]Blythe Witter & Co., Chicago, Ill. [40]Martin Judge Co., San Francisco, Calif. [41]A. J. Pattison Jr. & Co. Ltd., Toronto, Canada. [42]Nesbitt, Thomson & Co., Toronto. [44]E. H. Rollins, Chicago. [45]Dunlap, Wakefield & Co., Louisville, Ky. [46]First Union Trust & Savings Bank, Chicago. [47]Anderson Plotz and Co., Chicago, Ill. [48]Hemphill, Noyes and Co., New York City.

United States Gypsum Co.

THE accompanying balance sheet and statement of earnings of the United States Gypsum Co., Chicago, Ill., reflects the results of a continued decline in construction. Building demand for the period was the lowest since 1915, and has permitted the use of less than a quarter of the company's productive capacity. This condition has required drastic reductions in productive cost and in sales and administrative expenses.

The building of new mills and the decline in business have reduced the value of some of the older plants. Based on the tonnage allocated to such plants, the board of directors at the May meeting authorized a reduction of plant account of $7,700,000 to meet this condition. The balance sheet gives effect to this revision as of January 1, 1932.

Lehigh Cement Pays Preferred Dividend

THE directors of the Lehigh Portland Cement Co., Allentown, Penn., recently declared the regular quarterly dividend of $1.75 per share on the preferred stock, payable October 1 to holders of record September 14.

Although the statement of the company's earnings for the 12 months ended June 30, 1932, showed a loss, after provision for depletion, depreciation and obsolescence, of $484,020, the operations of the company for the second quarter of 1932 alone resulted in a loss of $406,387. The dividend to be paid October 1, 1932, will, based on the number of shares now outstanding, amount to approximately $326,951. The total deficit for the quarter chargeable against surplus will therefore amount to $733,337.

C. C. Long, secretary, says: "All preferred dividends for the calendar year ended December 31, 1931, amounting to $1,404,439, were paid out of surplus. The preferred dividends paid thus far this year have been drawn entirely from surplus and the preferred dividend to be paid October 1, 1932, must of necessity also be drawn entirely from surplus.

"In view of the substantial impairment to surplus and current available resources of the company within the past year, it is apparent that improvement in the earnings of the company, which will be possible only in the event of increased volume, must in the future determine dividend action on the preferred stock."

American Lime and Stone Bonds

THE Bankers Trust Co., trustee, until August 25 was to receive bids for the sale to it of American Lime and Stone Co. 1st mortgage sinking fund gold bonds dated April 1, 1922, to an amount sufficient to absorb $27,599 at prices not exceeding 104½.

CONSOLIDATED PROFIT AND LOS. ACCOUNT OF THE UNITED STATES GYPSUM CO. AND SUBSIDIARY COMPANIES

(For the six-month periods ended June 30, 1931 and 1932)

	1932	1 31
Net profits on operations before provisions for depreciation, depletion and income taxes	$ 1,748,641.53	$ 3,448 95.95
Other profits and income	280,756.96	397 66.88
Total	$ 2,029,398.49	$ 3,846, 62.83
Deductions from income	52,485.61	174,963.99
Net profits from all sources before provisions for depreciation, depletion and income taxes	$ 1,976,912.88	$ 3,671,498.84
Deduct—Provisions for—		
Depreciation and depletion	$ 899,667.64	$ 1,126,681.11
Income taxes	113,456.38	303,257.50
Total	$ 1,013,124.02	$ 1,429,938.61
Net profits—		
Total for period	$ 963,788.86	$ 2,241,560.23
Per share on common stock	.57	1.62

SUMMARY OF CONSOLIDATED SURPLUS ACCOUNTS FOR THE SIX-MONTH PERIODS ENDED JUNE 30, 1931 AND 1932

	1932	1931
Paid-in surplus:		
Balance at beginning of period	$ 6,507,998.95	$ 6,378,248.14
Surplus credits resulting from issuance of stock	*9,826.59	118,153.29
Balance at end of period	$ 6,498,172.36	$ 6,496,401.43
Earned surplus:		
Balance at beginning of period	$28,675,751.44	$28,235,563.35
Add—Net profits for six months	963,788.86	2,241,560.23
Total	$29,639,540.30	$30,477,123.58
Deduct—		
Adjustment of balance sheets of Canadian subsidiaries as of June 30, 1932, for depreciation in Canadian exchange	$ 10,881.34	.....
Reduction in book value of certain plant assets	7,700,000.00	.....
Cash dividends paid—		
On preferred stock	273,777.00	$ 274,459.50
On common stock	951,959.20	973,267.20
Total	$ 8,936,617.54	$ 1,247,726.70
Balance at end of period	$20,702,922.76	$29,229,396.88

*Deduction.

Operations of the Canadian subsidiaries for the six months ended June 30, 1932, are included in the above profit and loss account on the basis of average exchange rates prevailing during that period. Adjustment of balance sheets of Canadian subsidiaries as of June 30, 1932, for depreciation in Canadian exchange has been charged to earned surplus.

COMPARATIVE CONSOLIDATED BALANCE SHEETS OF THE UNITED STATES GYPSUM CO. AND SUBSIDIARY COMPANIES

ASSETS

	June 30, 1932	June 30, 1931
Current assets:		
Bank balances and working funds	$ 1,032,761.97	$ 540,095.07
Marketable securities, including accrued interest—at cost—		
U. S. Government securities	9,660,528.46	8,589,110.08
Municipal bonds	1,177,421.20	1,020,614.36
Accounts, notes and construction contracts receivable—		
Less reserves for bad debts	3,141,092.22	4,622,786.08
Inventories of finished goods, raw materials, supplies, etc. priced at cost which is not in excess of market	3,193,627.49	3,799,501.95
Total current assets	$18,205,431.34	$18,572,107.54
Stock subscriptions receivable, investments, etc.:		
Employes' stock purchase contracts	$ 1,558,690.67	$ 1,651,870.36
Bonds on deposit for insurance reserve, including interest—at cost	180,258.02	180,867.98
Miscellaneous stocks and bonds—at book value	120,787.17	87,821.56
Total	$ 1,859,735.86	$ 1,920,559.90
Plant and equipment—At book value:		
Land, gypsum, buildings, machinery, steamers, etc.	$50,453,182.42	$61,370,768.04
Less—Reserves for depreciation and depletion	10,144,246.15	11,973,487.92
	$40,308,936.27	$49,397,280.12
Deferred charges:		
Stripping costs, amortizable patent expenditures and prepaid expenses	$ 1,160,359.57	$ 1,043,776.47
Total assets	$61,534,463.04	$70,933,724.03

LIABILITIES

Current liabilities:		
Accounts payable	$ 291,990.12	$ 694,741.54
Accrued liabilities—		
Payrolls, local taxes, etc.	211,054.11	293,838.94
Federal income taxes	266,416.23	634,155.51
Total current liabilities	$ 769,460.46	$ 1,622,735.99
Reserves:		
Contingencies	$ 876,765.83	$ 903,012.32
Accident insurance, guarantees, etc.	497,961.63	501,357.41
Total	$ 1,374,727.46	$ 1,404,369.73
Capital stock and surplus:		
Capital stock—		
7% cumulative preferred—$100 par value	$ 7,822,200.00	$ 7,841,700.00
Common—$20 par value	24,366,980.00	24,339,120.00
	$32,189,180.00	$32,180,820.00
Surplus—		
Paid-in surplus	$ 6,498,172.36	$ 6,496,401.43
Earned surplus	20,702,922.76	29,229,396.88
	$27,201,095.12	$35,725,798.31
Net worth	$59,390,275.12	$67,906,618.31
Total liabilities	$61,534,463.04	$70,933,724.03
Net working capital	$17,435,970.88	$16,949,371.55

Traffic and Transportation

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week ending August 20:

NEW ENGLAND FREIGHT ASSOCIATION DOCKET

26226. **Sand, common** (not molding, fire, filter or blasting) and **gravel,** in straight or mixed carloads (See Note 3), from North Wilbraham and Westfield, Mass., to Chatham, N. Y. Present, $1 per net ton; proposed, 80c. Reason—To meet competition of nearby sand and gravel pits, thereby securing traffic to rail carrier.

TRUNK LINE ASSOCIATION DOCKET

29639. **Sand,** other than glass, carloads (See Note 2), from Goshen, Va., to Harrisonburg, Va., $1.10 per net ton. (See Note 4.)

29655. **Sand and gravel,** carloads (See Note 2), from Attica and Machias, N. Y., to Austin, Penn., $1.60, and Galeton, Penn., $1.40 per net ton. (See Note 4.)

29658. **Sand and gravel,** carloads (See Note 2), from Hopewell, Norfolk, Petersburg and Puddledock, Va., to various points in Virginia and West Virginia—Ada, W. Va., Banner, Bluefield, Carbo, Doran, Gardner, Nemours, Norton, Va., Powder, W. Va., St. Paul, Tazewell, Virginia City, Va., and various. Rates ranging from $1.76 to $2.02 per net ton. Proposed rates are applicable only on shipment loaded in open top cars. (See Note 4.)

29611. **Sand, zircon** (zircon ore), crude, carloads, minimum weight 56,000 lb., from Philadelphia, Penn., to Buffalo, N. Y., Niagara Falls and Suspension Bridge, N. Y., 19½c per 100 lb.

29668. **Stone, crushed, coated with oil, tar or asphaltum,** carloads (See Note 2), from Martinsburg, W. Va., to West Union, W. Va., $1.70 per net ton (subject to emergency charge). (See Note 4.)

29671. **Glass sand,** carloads (See Note 2), from Triplett-Gore, Va., to all points in Central Freight Association territory to which rates are published from Mapleton, Penn., and Berkeley Springs, W. Va., as per Agent Curlett's I. C. C. A-306, 15c per net ton over rates published from Mapleton, Penn., and Berkeley Springs, W. Va.

29679. **Crushed stone,** carloads (See Note 2), from Bethlehem, Penn., to D. L. & W. R. R. stations, Little Falls, Newark, Rockaway, New Village, N. J., Ackermanville, Bath, Priceburg, Plymouth, Bloomsburg, Northumberland, Penn., and various. Rates ranging from 90c to $1.70 per net ton. (See Note 4.)

29681. **Stone, natural** (other than bituminous asphalt rock), **crushed,** carloads (See Note 2), to points on the N. Y. C. R. R., Presho, N. Y., Westfield, Ulysses, Middlebury, Ansonia, Blue Stone, Newberry Jct., Penn., and various, from Stafford and LeRoy, N. Y., rates ranging from $1.30 to $1.70 per net ton, and from Oaks Corners, N. Y., rates ranging from $1 to $1.40. (See Note 4.)

Sup. 2 to 29286. Establish rates on **sand,** carloads (See Note 2), from Raritan River R. R. stations and Perth Amboy district to Ottawa, Ont., on basis of 2c per 100 lb. under Toms River, N. J.

CENTRAL FREIGHT ASSOCIATION DOCKET

32502. To establish on **crushed stone** to Blakesley, O., from Huntington, Ind., and Whitehouse, O., 80c and 75c respectively, via Wabash Ry. direct. Present, 99c and 80c respectively.

32526. To establish on **stone, fluxing** (ex lake), Painesville and Perry, O., to Lorain, O., 76c per gross ton. Present, 13c.

32533. To establish on **sand and gravel,** in open top cars, Akron, O., to Wickliffe and Willoughby, O., rate of 75c per net ton, emergency charge in addition. Present, 85c to Wickliffe and 90c to Willoughby, O., emergency charge in addition.

32560. To establish on **ground limestone,** carloads, minimum weight 50,000 lb., from Bedford, Ind., to Jacksonville, Fla., rate of 380c per net ton. Present rate, 530c ($1.40 per ton to New Albany, plus $3.90 per ton beyond New Albany as published in C. I. & L. Ry. I. C. C. No. 4464 and Speiden's I. C. C. No. 1340, emergency charge of 6c per ton in addition.

32581. To establish on **sand, blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica,** in straight carloads, Bremen, O., to Louisville, Ky., 252c per net ton. Present, 277c.

32550. To establish on **sand and gravel,** in straight or mixed carloads, Newtown and Gravel Pit, O., to stations in Kentucky on the L. & N. R. R. and C. N. O. & T. P. Ry., rates as shown in Exhibit A. Route—Via N. & W. Ry. to Cincinnati, O., L. & N. R. R. or C. N. O. & T. P. Ry. beyond. Present rates, combination.

EXHIBIT A

Rates in cents per ton from Newtown, Gravel Pit, O., to representative L. & N. R. R. stations.

Kentucky division

	Prop.		Prop.
Rosedale, Ky.	80	Maurice, Ky.	80
Spring Lake, Ky.	80	Independence, Ky.	85

Cincinnati division

	Prop.		Prop.
Ludlow, Ky.	80	Highland, Ky.	80

32564. To establish on **sand and gravel,** carloads, from Hamilton, O., to Xenia, O., 70c, plus emergency charge. Present, 120c per net ton, plus emergency charge.

32584. To establish on **sand** (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and **gravel,** in open top equipment, carloads, Cleveland, O., to Johnstown, Penn., 160c per net ton (emergency charge not included). Present, 230c (emergency charge not included).

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

Note 4—Reason—Proposed rates are comparable with rates on like commodities for like distances, services and conditions.

32587. To establish on **crushed stone,** carloads, from Milltown, Ind., to stations on various lines in Illinois, rates as shown in Exhibit B.

EXHIBIT B

(Rates in cents per 2000 lb., from Milletown, Ind., to representative points in Illinois)

	Pres.	Prop.		Pres.	Prop.
B. & O. R.R.					
Edgewood	128		Shawneetown	125	
Hubbard	135	115	Noble	113	115
Sacramento	120		Bridgeport	115	
C.C.C. & St.L. Ry.					
Flat Rock	115		Eldorado	126	121
Lawrenceville	113	110	New Burnside	130	
C. & E. 1. Ry.					
Kinmundy	130		Marion	126	
Salem	130				
C. B. & Q. R. R.					
Cravat	125		Christopher	135	
I. C. R. R.					
Robinson	120		Edgewood	130	
Parkersburg	115		Central City	130	
L. & N. R. R.					
Woodlawn	125		Epworth	115	
Enfield	120				

32608. To establish on **sand** (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and **gravel,** carloads, Fremont, O., to Fostoria, O., 60c per net ton, subject to emergency charge. Present, 70c.

32610. To establish on **sand** (other than blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) or **gravel,** carloads, Saegertown, Penn., to Conneautville, Springboro, Penn., 70c; Albion, Penn., 80c per net ton. Present, 90c (present rate to Erie, Penn., to which point Conneautville, Springboro and Albion, Penn., are intermediate).

32638. To establish on **sand and gravel,** carloads, in open top equipment, from Dresden, O., to Lancaster, O., rate of 70c per net ton (emergency charge not included). Present, 90c (emergency charge not included).

32641. To establish on **crushed stone,** carloads, from Sandusky, O., to West Oberlin, O., rate of 70c per net ton via B. & O. R. R., Monroeville, O., W. & L. E. Ry., Wellington, O., L. & W. Va. Ry., plus emergency charge. Present, 240c per net ton, plus emergency charge.

32644. To establish on **crushed stone and crushed stone screenings,** carloads, from Narlo, O., to Neffs and St. Clairsville, O., rate of 145c per net ton, subject to emergency charge, via N. Y. C. & St. L. R. R., Bellevue, O., and W. & L. E. Ry. Present, 20c to Neffs and 19c to St. Clairsville.

WESTERN TRUNK LINE DOCKET

1873-O. **Chatt** (mine gravel), **whole or crushed; stone, crushed** (broken stone, ranging in size up to 200 lb. in weight); **gravel; sand** (except absestos sand and silica sand), (See Note 3), between points in Kansas on intrastate traffic only for single line movement. Rates in cents per ton.

Miles	Present One line	*Proposed One line	Present Nebraska
10 mi. and under	50	50	40
10 to 20 mi.	56	50	40
20 to 25 mi.	62	50	40
25 to 30 mi.	62	55	45
30 to 40 mi.	68	55	45
40 to 50 mi.	74	60	50
50 to 60 mi.	80	65	55
60 to 70 mi.	85	70	60
70 to 80 mi.	90	80	70
80 to 90 mi.	95	90	80
90 to 100 mi.	100	95	90

Rates to expire December 31, 1932.

*Proposed scale of rates not to be published as a mileage scale, but to be used in determining specific rates for single line application for the purpose of meeting motor truck competition.

SOUTHWESTERN FREIGHT BUREAU DOCKET

25423. **Dolomite, crushed or screened,** from Dolomite Switch, Mo., to Valmeyer, Ill. To establish a rate of 100c per ton on dolomite, crushed or screened, carloads (See Note 3), from Dolomite Switch, Mo., to Valmeyer, Ill. It is believed that the proposed rate is reasonable for a distance of 72 mi. as compared with rate of 85c per ton to Granite City, Ill., for a distance of 73 mi.

TEXAS-LOUISIANA TARIFF BUREAU DOCKET

8524-TX. **Sample of sand** for testing purposes, in bags, barrels or boxes, L.C.L., between points in Texas, intrastate, interstate, also between Shreveport Group and Texas points: Proposition from shippers to establish one-half of fourth class rates.

This sand is used by foundries for testing purposes and interested shippers advise they will ship out same in L.C.L. lots.

Proposed I. C. C. Decisions

25020. Crushed Stone and Slag. In a proposed report in No. 25020, rates on crushed stone, gravel, sand and slag within the state of Ohio; No. 24597, Bessemer Limestone and Cement Co. vs. Akron and Berberton Belt Railroad Co. et al. and four sub-numbers thereunder, Carbon Limestone Co. vs. Same; Lake Erie Limestone Co. vs. Same; Standard Slag Co. vs. Same, and Union Limestone Co. vs. Same, Exeaminer Rice has recommended that the commission condemn the intrastate rates in Ohio on crushed stone, gravel, sand and slag, in open-top cars, as unjustly discriminatory against interstate commerce, and unduly preferential of shippers in Ohio and unduly prejudicial to shippers in West Virginia and in western Pennsylvania. He also recommended that the commission find unreasonable the rates on crushed stone, from Hillsville, Shaw Junction and Walford, Penn., and rates on slag, from Midland and Sharpsville, Penn., and from Weirton, W. Va., to destinations in Ohio.

Examiner Rice has recommended the removal of the unjust discrimination, undue prejudice and unreasonableness by the use of a scale known as the PSM 823 distance scale approved on January 7, 1926, by lines in Ohio, and on January 26, 1926, by the Central Freight Association general committee, for use by the petitioning carriers and

by other carriers as a guide in making rates for the future on crushed stone, gravel and sand between points in Ohio. This scale, the report said, did not provide any additional charge for transportation over joint lines, but was for application to both single and multiple-line hauls. However, said the examiner, this omission of a joint-line arbitrary was offset, partially or wholly, by the fact that that scale was slightly higher for most distances than the single-line scales which were applied on the materials involved in the report in Indiana, Michigan, West Virginia and the western half of Pennsylvania.

The scale to be used begins with a rate of 60c a ton for the initial block of 5 mi., becomes 65c at 25 mi.; 85c at 50 mi.; 95c at 75 mi.; 105c at 100 mi.; 115c at 125 mi.; 125c at 150 mi.; 135c at 175 mi., and runs out with a rate of 145c at 200 mi.

I. C. C. Decisions

24316. Imported Cement. Hidalgo County Water Control and Improvement district No. 6 vs. St. Louis, Brownsville, and Mexico, et al, by division 3, dismissed. The rate of imported cement from Corpus Christi to Chihauhau, Tex., was found applicable and not unreasonable or otherwise unlawful. Intrastate rate on cement from and to the same points were found not unduly prejudicial or discriminatory against interstate commerce. An interstate rate of 22 c. was collected on the cement from Belgium. Contemporaneously there was an intrastate rate of 16 c. Complainant sought that rate for the future, the report said, and as the basis for reparation.

3736. Truck Competition in Cement. The Commission, in I. and S. No. 3736, cement from Hudson, N. Y., to Massachusetts, in a report written by Commissioner Brainerd, has authorized the Boston and Albany to reduce its rates on cement from Hudson and Upper Hudson, N. Y., to Bondsville and Greenwich Village, Mass., and other stations in Massachusetts to enable it to compete with trucks for the hauling of cement to the water system works the state of Massachusetts is constructing in the Swift river valley, near Bondsville and Greenwich Village, about halfway between Boston and Hudson. The present rates from the Hudson district in which Hudson and Upper Hudson are located, the report says, range from 11.5 c. to Middlefield, to 13.5 c. to Greenwich Village. The schedules under suspension cut those rates to 11 c.

Protests came from three points in the Hudson group and about 19 mills in the Lehigh district in Pennsylvania and New Jersey. The latter pointed out that the proposed reductions would increase the spread in the prices of cement, due to the change in transportation costs, to their disadvantage.

Three thousand barrels of cement, the report said, moved from Hudson to the water works by truck, that cement having been used in the first contract. The second contract will require from 30,000 to 40,000 bbl. and the third about 225,000 bbl. The carrier said that it had lost tonnage to the trucks not only on this project but others in Massachusetts as well, one project requiring between 13,000 and 14,000 bbl. Reductions were proposed to some of the points solely to avoid fourth section departures.

The commission found the reductions justified except as to those stations west of Bondsville, ordered the schedules found not justified to be canceled and discontinued the proceeding. Relief from the long and short haul part of the fourth section was granted in fourth section order No. 10977 to maintain higher rates at intermediate points between Hudson and Athol, Mass., and between Hudson and Bondsville.

Close Hearings in Rate Case at Moline

ALL EVIDENCE in the cases involving freight rates on sand, gravel and crushed stone from points in Missouri and Iowa to western Illinois has been completed at the final hearing in Moline.

Parties were given until September to file briefs, after which Examiner Fuller will examine the evidence and make a tentative report to the commission at Washington. Exceptions will then be filed and the case will come before the commission at Washington for consideration. After the case has been considered by the commission a decision will be made.

The question to be decided is whether the present freight rates on sand, gravel and crushed stone from cities in Missouri and Iowa will remain as they are or if they will be raised as the railroads desire.—*Rock Island* (Ill.) *Argus.*

Rules That Trucks Have "Freight" Rates

THE TERM "freight rates" in state highway contracts applies to truck as well as railroad rates, the Nebraska supreme court has ruled.

Its decision came in affirming an order denying the right of the state of Nebraska to deduct certain sums from the Lyman-Richey Sand and Gravel Co. in payment for state contracts.

The state had sought to deduct the amount of railroad freight reductions on gravel used on a highway construction project under terms of a contract permitting such deductions if "freight rates" are reduced after award of any contract.

The Lyman-Richey company went to court to prevent the reductions, claiming it had based its bids to contractors for gravel on truck rates, which were far lower than the old railroad rates. When the railroad rates were reduced it moved the gravel by rail instead of truck, although the rail rates were said to be still higher than the truck rates used to make bidding estimates.

The company claimed if the state was permitted to make the reductions it would be the actual loser.

The action became a controversy as to whether there is such a thing as truck "freight rates." The state and the railway commission claimed there are no regular truck rates. Numerous truckers support the gravel company's claim that trucks as well as railroads have "freight rates."

In upholding the trial court's decision that there are truck rates, the supreme court held that a contract should be construed the more strictly against the party drawing it.

Judge "Paine," who wrote the opinion, ruled:

"The clause in controversy in the contract would not apply unless there was an actual saving or an actual loss to the contractor by a change in the freight rates. The purpose of this clause was to do equity between the state and the contractor."—*Omaha* (Neb.) *Bee.*

Mississippi Fights Injunction Maintaining Gravel Rates

COURT ACTION aimed at dissolution of an injunction to prevent imposition of new freight rates on sand and gravel was started August 5 by the Mississippi Railroad Commission and the office of Attorney-General Greek L. Rice.

An injunction, granted on petition of the Gulf, Mobile and Northern and other roads, enjoined the railroad commission from putting into effect slightly lower rates which it recently ordered effective July 15. In the absence of the new schedule the tariff set last December has continued in effect.

Should the state win its attempt to dissolve the injunction, then the new rates would become immediately effective.—*Jackson* (Miss.) *News.*

File Complaint on Cement Rate to Pacific Northwest

RATES said to amount to a subsidy to California cement manufacturers are being protested by northwestern manufacturers, including the Spokane Portland Cement Co. and the Lehigh Portland Cement Co., the *Spokane Chronicle* reports.

These companies filed a joint complaint with five other cement manufacturers in Washington and Oregon, asking the Interstate Commerce Commission to restrain the railways from permitting continuance of low rates from California to northwestern points, on August 5.

Alabama Rejects Petition for Agricultural Limestone Rates

THE Alabama Public Service Commission has rejected a petition of the railroads for permission to establish certain rates on agricultural limestone and fixed other rates.

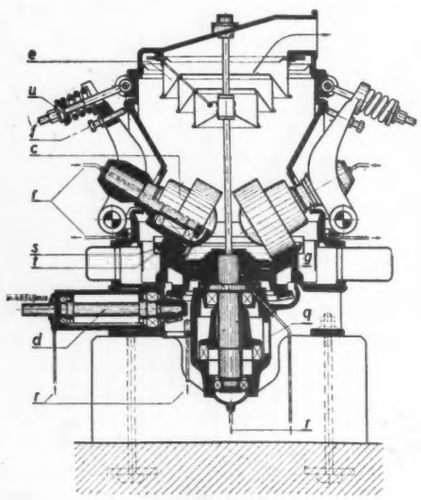
It was noted that the Interstate Commerce Commission has reopened its docket No. 17517 for further consideration and the Alabama Commission stated that if the former should adopt a merged scale for single-line and joint-line hauls of sand, gravel and crushed stone for interstate traffic, then the intrastate rates on agricultural limestone may be given further consideration in order to maintain the prescribed relationship with the other commodities.

Foreign Abstracts and Patent Review

Special Mixed Cement of a High-Grade Strength. This patent covers a mixture of the following: (1) The calcined products of igneous rocks, such as granite, liparite, quartz or porphyrite, diorite and the like. These are prepared for use by being calcined for about two hours at 800 deg. C.; (2) acid compounds such as soluble silica, soluble alumina, and soluble iron oxide of decomposed matters of tuff, basalt, andesite and the like; and (3) portland cement clinker.

Proportions mentioned in the specifications are: 42% to 22% of the first, 22% to 42% of the second, and 30% of the third (portland cement clinker). It is claimed that the first ingredient promotes stability of the mixed cement against heat, chiefly by reason of the calcined quartz present, and also that it gives a continuous increase in strength for a long time. The second class of materials is said to accelerate the hardening of the cement, chiefly because of the colloidal solution compounds present, thus making an early high strength cement. The method of combining is to grind the first and second class materials together at a temperature of 150-200 deg. C. Then the portland cement clinker is added and the entire mass is reground to an intimate mixture of fine powder. The inventors claim that this cement has superior waterproof quality and water resistability in addition to a very high strength.—*Shoichiro Nagai and Kichizo Kawamura, Assignors to Gosuke Imai, Tokyo-Fu, Japan, U. S. Patent No.* 1,821,565.

Ring-Roll Mills Versus Mill Drying. H. Laeger, in discussing ring-roll mills and mill drying, describes the advantages of the Loesche mill, which has been in use for about three years. A Loesche mill installed three years ago in a Westphalian cement plant has an hourly output of 18 tons grinding limestone and marl of an average moisture content of 6%, to a fineness of 20 to 25% residue on the 178-mesh sieve. The fact that this grinding is done continuously without any predrying of the material signifies great progress when it is considered that the cost of the entire machinery equipment inclusive of motors is not even one-half of that which is required for a compound mill with drier and accessories of equal output, and thereby does not require even one-fifth of the floor space.



Does not require pre-dried material

The entire power requirement is found to be 12.1 kw.-hr. per metric ton, which is exceedingly favorable. In the three years of operation only one set of grinding parts, weighing about 2420 lb., was worn out after operating more than 10,000 hours. The cement plant depends on this one mill for continuous operation. The output of the mill, however, would increase if the material were predried.—*Zement* (1931) **20,** 42, pp. 918-921.

Significance of Thermic Dissociation of Iron Oxide in Cement Burning. H. Kuehl and R. Rasch review first the literature dealing with iron oxide in cement production. Since they found that the behavior of iron oxide in the sintering of cement material is still unexplained, and that the appearance of discoloring of clinker cannot be explained solely by the theory of dissociation of calcium ferrite, they made an investigation to determine how within the temperature range of the cement kln the dissociation of pure iron oxide takes place and how the dissociation processes of compounds of iron oxide, which may occur in portland cement clinker, really take place. The dynamic method was used in the investigations, the apparatus and handling of which are described in detail and illustrated.

It was found by the gas-volumetric measurements that the dissociation of pure iron oxide in oxygen atmosphere becomes noticeable at 1400 deg. C. and takes place rather vigorously already at 1500 deg. C. But the reaction terminates rather rapidly and long before the principal amount of the iron oxide has disintegrated. The possibility of the formation of fixed solutions of iron oxide and ferrosoferric oxide is discussed as a basis for this phenomena.

The dissociation of iron oxide is strongly checked in lime-bearing systems and the more, the more lime there is; at a test temperature of 1500 deg. C. and a test period of 20 min. in an oxygen atmosphere only a small fraction of the iron oxide contained in portland cement is converted into ferrosoferric oxide.

Even though in cement kilns the splitting off of oxygen in normal kiln operation can play but a small role, it is apparently the basis for a certain potassium permanganate consumption of most portland cements.

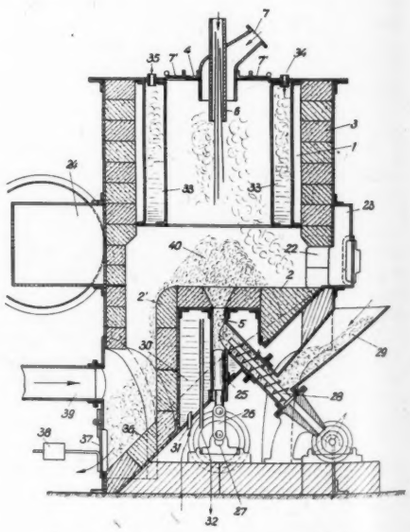
It appears as if the greenish-black color of portland cement clinker is conditioned essentially by its content of ferrosoferric oxide. The appearance of brown, red and reddish-brown color tones can be explained in many cases by the competition between ferrosoferric oxide, iron oxide and ferrites of the calcium.—*Zement* (1931) **20,** 36, pp. 812-816, 37, pp. 833-836.

Introduction of Air in Shaft Cement Kilns. E. Schirm describes first the advantages and disadvantages of shaft cement kilns as compared with rotary cement kilns and then describes and illustrates a number of methods of introducing air in shaft kilns to effect a better air distribution with consequent more uniform burn.—*Zement* (1931) **20,** 35, pp. 796-801.

Recent Process Patents

The following brief abstracts are of current process patents issued by the U. S. Patent Office, Washington, D. C. Complete copies may be obtained by sending 10c to the Commissioner of Patents, Washington, D. C., for each patent desired.

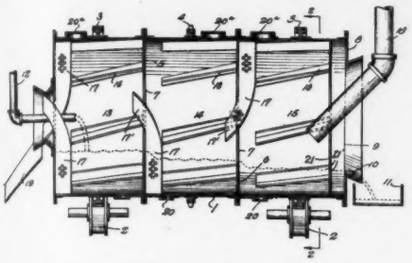
Calcining Furnace. The purpose of this invention is to have the heat impinge directly on the material to be calcined in order to save the lining of the furnace. Several forms are shown. In the one below the material is pushed up through a central channel by a screw and it forms a heap (40) on what might be called the hearth of the furnace. The flame is blown downward through pipe 6. There is a channel below the heap in which there is a piston, and when this



Designed to save furnace lining

piston pushes up it causes material to roll off the hearth, exposing fresh material to the blaze.—*Ernst Curt Loesche, Germany, U. S. Patent No.* 1,832,226.

Washer. This washer uses the counter-current principle, the material going through it against the flow of water. The washer is divided into three compartments and there are scoops which pass the material from one compartment to the next and finally to the discharge. The openings in the ends and in



Uses counter-current principle

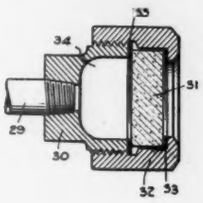
the partitions increase in size through the washer, the smallest opening being at the end where the washed material is discharged and the clean water admitted. This insures that the water will flow against the movement of the material. This should be an excellent washer, economical of water, for such rock products as sand, stone, gravel, phosphate rock and the like.—*R. W. Rigler, U. S. Patent No.* 1,824,688.

Method of Making Portland Cement. The feature of this method is the drying of the slurry before it goes into the kiln. This is done by the hot clinker which goes into a long cylinder in the center of a rotary dryer. As the heat of the clinker is not sufficient to dry all the slurry, only a part of it is taken off from the ball mill discharge. The remainder is fed directly to the kiln. The inventors say that a drier slurry can be produced by using hot water, and they show how the water may be heated from the hot gases in the kiln stack.—*Adelbert C. Eichenlaub and Herman G. Loffler, Assignors of one-third to Conrad C. Miller, Des Moines, Iowa, U. S. Patent No.* 1,832,192.

Making Porous Concrete. This is a method of making concrete from shale lime, or alum-shale lime, with portland cement and a powdered metal which will react with water, such as zinc, alumina or magnesium. Examples of mix given are: shale lime, 75-80%; portland cement, 15-30%; and 0.25% of zinc powder with 50-100% water. Also, 60-80% portland cement, 40-20% shale lime, 0.15% aluminum powder and 40-80% water. The specification says that this material can be easily sawed and cut, and it considers the most economical method of making it is to cast it in large masses which can afterward be cut to the required size and shape. The weight is stated to be about half that of water.—*John Axel Erikson, Sweden, U. S. Patent No.* 1,819,018.

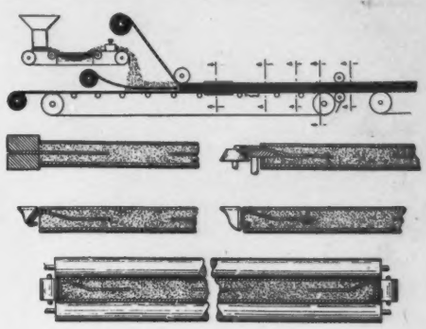
Method for Aerating Slurry. This method differs from others only in the use of a peculiar type of nozzle through which the

Nozzle filter passes air but not solids



compressed air enters the slurry. The pipe nozzle terminates in a cup-shaped piece which is closed by a disc of filtrous or similar material so porous that air can pass through it easily, but the solids that are in the slurry cannot pass through it. Other illustrations show this nozzle applied to a Dorr agitator. —*William A. Neill and William A. Stedman, Assignors by Mesne Assignments to the Dorr Co., New York, N. Y., U. S. Patent No.* 1,832,469.

Reinforced Wall Board. The patent describes the making of a wall board by supporting a continuous paper sheet on a wire or felt belt of the kind used in paper making, spreading a plaster mixture on it,

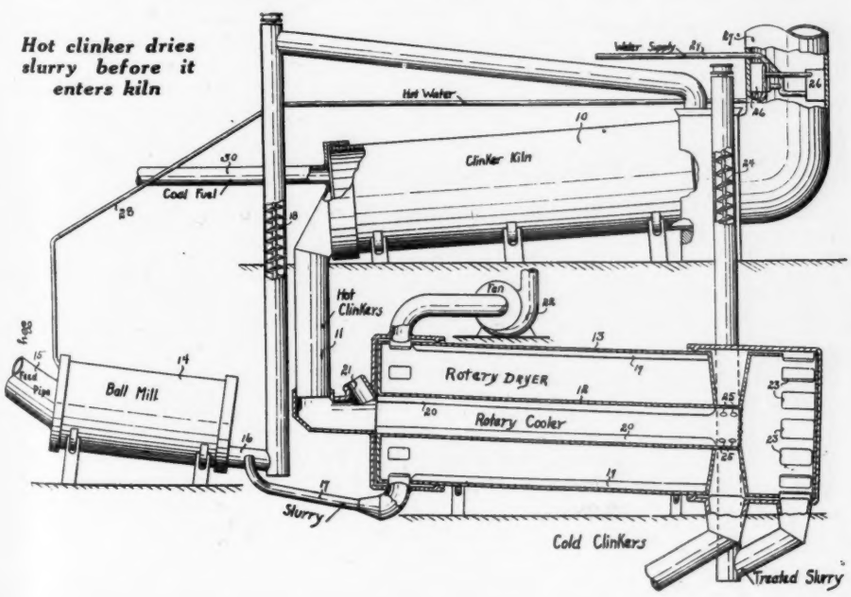


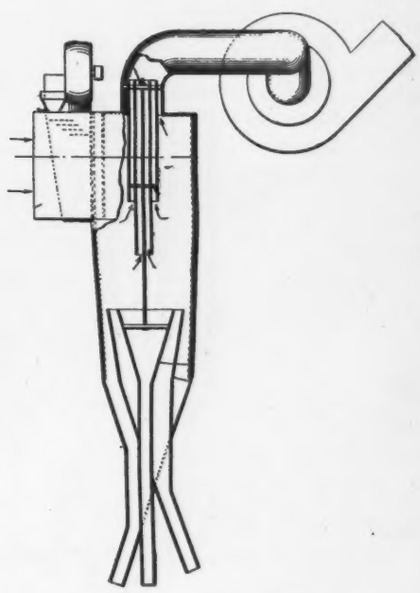
Steps in making wallboard

adding a perforated reinforcing strip and finishing with a top cover sheet. But the one feature that is closely covered by the patent claims is the method of making the edge from the strip of reinforcing paper. This consists of bending the projecting edge with a conical roll and then forcing the bent over portion into the soft plaster. The steps are shown in the illustrations. *Harry C. Raynes, assignor to Bemis Industries, Inc., U. S. Patent No.* 1,808,571.

Air Classifier. This classifier is made from a cyclone of the long and narrow type by putting in pipes and partitions so that the lifting force of the fan is greater in some parts of the cyclone body than in others. This permits the fall of the heavier particles in three concentric cylinders, the heaviest materials going to the outside. Another important feature of this machine is the use of a booster fan on the inlet for circulating a broad band of air around the wall of the cyclone.—*Albert H. Stebbins, U. S. Patent No.* 1,832,256.

Hot clinker dries slurry before it enters kiln





Lifting force of fan varies

Pennsylvania Rejects Gas Tax Diversion

Highway Funds Are Spared as Special Session Passes Sales Levy

DECLINING to pass further legislation depleting state highway funds, and assured by Governor Pinchot that if it did so he would use the power of the veto, the legislature of Pennsylvania, in special session, has just passed a measure providing for a general sales tax of 1%, to furnish funds for unemployment relief.

Earlier determined efforts had been made to divert from $4,000,000 to $12,000,000 of the gasoline tax revenues of the state to this purpose, and it was only after it became apparent that such action would create almost as much more unemployment as it could relieve, were the proposed measures abandoned. Bills calling for the diversion of the gas money eventually met so much opposition in the senate and from the administration that they were hopelessly sunk.

One of the measures proposed a diversion of $4,000,000, which, with $6,000,000 from special taxation and $2,000,000 from economies of governmental administration, would have provided a relief fund of $12,000,000. Another sought to raise the entire $12,000,000 by diverting gasoline tax proceeds. The effect of the former would have been to seriously cripple highway building, while the passage of the latter would have swelled the state's unemployed by many thousands.

A few days ago, after the proposal for a general sales tax had passed second reading in the senate, it was conceded that the measure would become law, as the senate regarded it even more favorably than did the house. The latter had passed the bill previously and it was then understood to be favored by the governor. It will become effective September 1, and will continue in force for six months. The new tax will apply to all sales by dealers but exempts sales by farmers direct to consumers and real estate transfers. It is estimated that the new tax will yield $12,000,000 to $15,000,000, the entire sum to be used solely for unemployment relief. With the passage of this measure Pennsylvania joins Mississippi, the pioneer state to introduce the sales tax.

In a public statement which is credited with having had much to do with shaping sentiment against diverting road funds, the Pennslyvania Construction Council gave the following reasons for opposing legislation that would divert gasoline taxes and motor license fees:

1. Spent exclusively for highway construction and maintenance, this revenue now provides employment in Pennsylvania for a large army of men.

2. In the form of well-built and well-maintained roads, this revenue provides a dividend-paying investment to the motorists and the general public.

3. Money spent for highway construction and maintenance also insures employment for thousands of men in the basic industries that produce, prepare and transport the essential materials and accessories. Therefore, to divert any revenue from the highway field would further curtail production of basic materials, increase unemployment and simply prolong the industrial depression.

4. With motorists already taxed to the limit of endurance, it would not be fair to them to use their taxes for purposes unrelated to automobile operation.

5. Gasoline taxes in reality are a form of toll which the motorists pay for the privilege of having good roads.

6. The original intention of the gasoline tax was to provide funds for highway construction and maintenance; and it is an economic axiom that they cannot be equitably used for any other purposes.

7. As long as there is a logical need for highway improvements, there can be no economic justification for taking the motorists' taxes and using them for miscellaneous purposes.

8. There are upwards of 100,000 miles of roads in Pennsylvania. Not even all of the 13,000 miles on the main state system have been surfaced. There are thousands of miles of important roads in Pennsylvania that are urgently in need of resurfacing and widening, and there are many state route bridges that should be repaired or rebuilt. As long as such conditions exist, it would be unfair to labor, industry and the general public to curtail the volume of employment that is making for efficient, safe and economical automobile operation.

9. T. H. MacDonald, chief of the U. S. Bureau of Public Roads, has demonstrated that from 75 to 90% of the money spent on highways goes to wage earners. Assuming an average of 50 c. an hour for labor, this means that Pennsylvania's gasoline tax revenue ($33,000,000) is paying for between 50,000,000 and 60,000,000 man-hours of labor every year. The total revenue derived from Pennsylvania's motorists insures about 130,000,000 man-hours of work annually.

10. To use any part of Pennsylvania gasoline tax revenue for direct unemployment relief would of necessity reduce the volume of employment that is still available. In other words, it would be a flagrant case of robbing Peter to pay Paul.

Gas Tax Diversion Too Hot for Pennsylvania Legislature

"NOT ON YOUR LIFE," said the Lancaster Intelligencer, editorially, as the Pennsylvania legislature debated a bill to divert 12 millions of state highway funds to poor-relief in Philadelphia.

"Let Road Funds Alone," stormed the Harrisburg Telegraph. Sharp protest in many other papers convinced the legislature that the subject was too hot to handle. Third reading of the bill was postponed, and the lawmakers took up instead a proposal to raise money through a sales tax.

THE EDITOR: In the article in your issue of July 30, "General Sales Tax Points Way to Save Highway Funds," we note at the top of page 39 in the second column your reference to work of the Pennsylvania State Construction Council in opposing gas tax diversion. The article goes on to say that the "Pennsylvania Chapter of the Associated General Contractors, the automobile clubs and the new organized Auto Users Association made known their opposition to measures threatening highway funds."

In view of the fact that a successful fight against gasoline and motor fund diversions has just been concluded in the extra session of the Pennsylvania legislature which adjourned last week after adopting a sales tax instead of diverting motor funds, we feel that a statement regarding the working organization in this state may be of interest.

A Conference of Pennsylvania Construction Industries was organized under that name in 1930 under the leadership of the Associated Pennsylvania Constructors. The constructors' association is the state-wide organization of general contractors throughout Pennsylvania. It was for many years the Pennsylvania branch of the Associated General Contractors of America, but is not now affiliated with that body. In the Conference of Pennsylvania Construction Industries were affiliated with the constructors, all of the other interests connected with construction in the state, including the sand and gravel producers, slag producers, steel interests, Portland Cement Association, surety interests, paving brick manufacturers, asphalt and tar interests, concrete pipe manufacturers. In June of this year when it became evident that a special session of the state legislature was to be called for the purpose of providing relief for the unemployed and signs of coming attempts to divert gasoline tax and motor funds were evident, the Conference of Pennsylvania Construction Industries promptly became active. At that time the name of the organization was changed to Pennsylvania Construction Council. A campaign against any diversion of gasoline tax was carried on to a successful conclusion.

In waging the fight, various automobile clubs were helpful in arousing the interest of their members and a number of national organizations, including the American Road Builders Association, National Sand and Gravel Association and National Automobile Chamber of Commerce, lent their assistance. It is believed, however, that the Pennsylvania Construction Council is entitled to considerable credit for the final result.

W. D. MAXWELL, Secretary,
Pennsylvania Construction Council

Labor Provisions for Federal Highway Work Favor Use of Commercial Aggregates

PROVISIONS DESIGNED to insure the maximum employment of local labor, to reduce the hours of employment and better the conditions of employment and to compel predetermination of wages to skilled and unskilled labor, in connection with contracts let for Federal-aid highway construction work under the Emergency Relief Act, are outlined in new regulations just issued by the Bureau of Public Roads.

The revised regulations were issued, the bureau explained, to meet requirements in the relief act concerning wages, hours of employment, hiring of local labor and preference for war veterans with dependents.

One of the chief objectives being to insure employment of a maximum number of men, the rules require that clearing and grubbing the roadbed, grading, trimming slopes and such work on the road shall be done by hand labor.

The following provision regarding the production of aggregates from roadside pits is of interest:

"Roadside production of crushed stone and gravel—Stone shall be loaded in the quarry by hand. Where the crusher is set at approximately the same elevation as the floor of the quarry, the stone shall be transported to the crusher by hand or team methods. Where feasible, team power or hand labor will be used in gravel pits for transporting material to screening plants or loading traps. Stripping of quarries and gravel pits, where feasible, shall be done by team or hand labor methods or both."

Jobs Instead of Doles Is Early Trend in Plans to Use Federal Loans

DETERMINED EFFORT on the part of state and local governmental officials to place as many men at work as possible is seen in early plans for using federal loans under the Emergency Relief Act.

The desire to give jobs rather than doles is strikingly evident in proposals announced by states and local communities to take up the $300,000,000 available for work relief or direct relief.

If all of this fund were to be devoted to construction work, some 200,000 men would be given jobs directly on projects, it is estimated. Another 200,000 workmen would be kept busy supplying materials and equipment, making a total of 400,000 jobs.

States making loans from this $300,000,000 fund are to repay them from future federal road aid allotments. States, therefore, are naturally evidencing a desire to place this money in urgently needed roads if at all possible.

Counties and cities borrowing from this fund must arrange their own repayments. So, in accordance with the spirit of the Relief Act, many local communities are also laying plans to use their borrowed funds for public improvements. They feel that in addition to obtaining needed facilities such action will benefit the needy and jobless at least as much as though the money were dissipated through doles.

In full realization of the value of work relief, South Carolina has indicated that she will likely apply for $10,000,000 from the $300,000,000 federal fund to bring her state highway system near completion. Governor Pollard of Virginia has asked for $3,500,000 for the same purpose.

San Francisco plans to ask for $350,000 for the construction of the much-needed Junipera Serra Boulevard and a portion of the Ocean Shore Highway.

Spokane county, Washington, is asking for $1,500,000 to be used in eight major highway projects of a total length of 75 miles. Because it would provide the greatest amount of employment, concrete pavement is specified by the county commissioners.

Frank Petry

FRANK PETRY, 46, metropolitan sales manager for the Pennsylvania-Dixie Cement Corp., died suddenly from a heart attack at Hackensack Hospital, Hackensack, N. J., August 8, 1932.

Frank Petry

Mr. Petry was widely known in the construction field through his activities in the cement industry with which he has been connected for the past 21 years.

Mr. Petry is survived by his widow and a sister.

Appoints Sales Manager

THE PENNSYLVANIA-DIXIE Cement Corp., New York, N. Y., announces the appointment, effective August 15, 1932, of Dan R. Long as district sales manager in charge of its activities in metropolitan and suburban New York, northern New Jersey, and western Connecticut, with headquarters in New York City.

Mr. Long's experience in marketing cement dates back to 1916; at which time he joined the sales force of the Atlas Portland Cement Co. in the Minneapolis district. Shortly afterward he was transferred to the general sales office in New York, and in succeeding years, with that company, his activities included supervision of various district sales offices in the territory east of the Rocky Mountains. Subsequently Mr. Long joined the sales department of the Pennsylvania-Dixie Cement Corp. in New York City.

Appoints Eugene Frost Director of Sales

THE Atlas Powder Co., Wilmington, Del., has announced appointment of E. Frost as director of sales, succeeding the late J. W. Mathews. Mr. Frost will have full charge of all selling activities in the explosives department.

Mr. Frost entered the explosives business in 1910 as sales manager for the Jefferson Powder Co., Birmingham, Ala. In 1915, when the Jefferson company was absorbed by the Aetna Explosives Co., Mr. Frost continued with that company until 1921, when he became general sales manager of the Grasselli Powder Co., Cleveland, Ohio. His next advance in the industry was when he became vice-president and treasurer, in March, 1922, of the newly organized Peerless Explosives Co. On the merger of the Peerless Explosives Co. with the Union Explosives Co. in 1930, Mr. Frost became vice-president in charge of sales of the Peerless-Union Explosives Corp.

In March of the current year, when the Atlas Powder Co. acquired the Peerless-Union, he was made general sales manager of the Atlas company, and now succeeds to the position of director of sales.

Cement Plants to Ship by Rail Only

THE North American Cement Corp. and the Alpha Portland Cement Co. plants in Catskill, N. Y., plan to ship all new orders by railroad instead of trucks.

The only use now to be made of motor trucks for transportation of cement is where contracts made prior to August 1 were figured on that method of transportation.

The price of cement has increased 29c. a bbl. Conditions in the cement industry are said to be much better.—*Albany* (N. Y.) *Times-Union.*

Cement Products

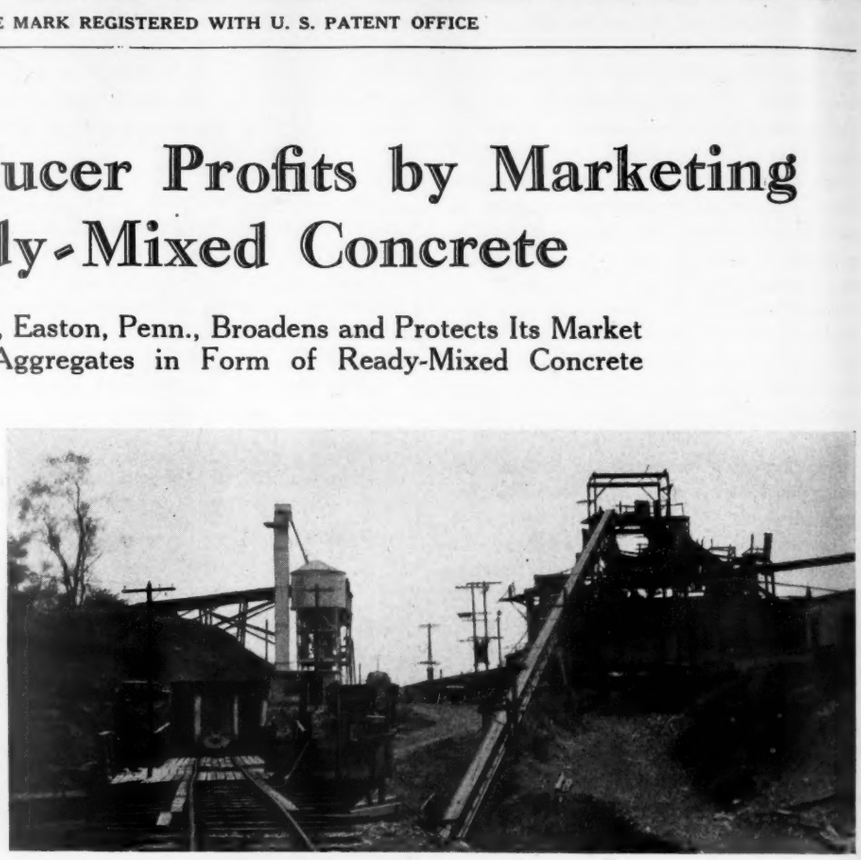
TRADE MARK REGISTERED WITH U. S. PATENT OFFICE

Gravel Producer Profits by Marketing Ready-Mixed Concrete

Steckel Sand Co., Easton, Penn., Broadens and Protects Its Market by Furnishing Aggregates in Form of Ready-Mixed Concrete

ALONG WITH a great many other producers of aggregates, the Steckel Sand Co., Easton, Penn., with a plant at Phillipsburg, N. J., decided something over a year ago that it would be to its advantage to produce ready-mixed concrete as well as sand and gravel. Hence a batching plant of moderate size was installed and several trucks with mixing bodies were added.

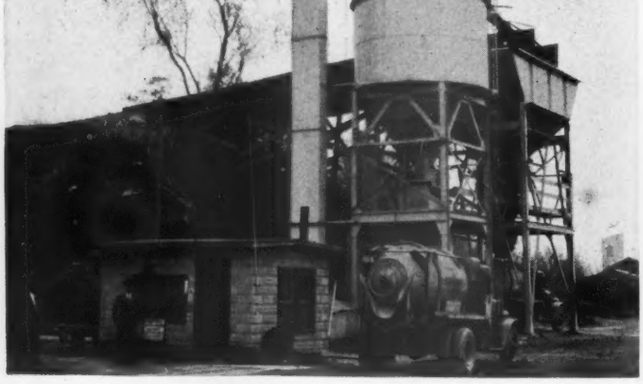
The batching plant adjoins the aggregate producing plant and is within easy trucking distance of both Easton and Phillipsburg. The installation consists of aggregate and cement batching bins in connection with a bulk cement handling system.

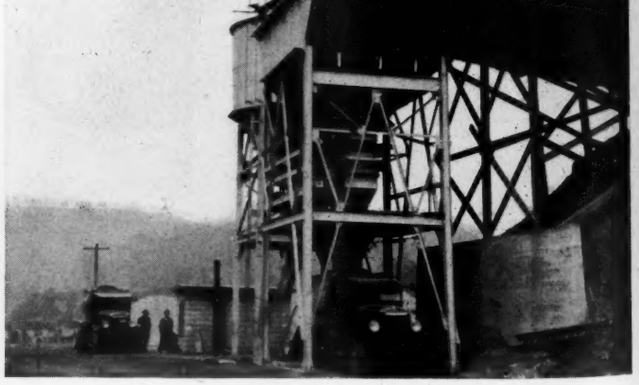


Batching plant and sand and gravel plant viewed from pit

Simple and Efficient Batching Plant

Since the site lent itself easily to that method, the aggregates are trucked to the level of the top of the hopper and dumped directly into it, thus obviating the necessity of any elevating or conveying equipment. A 3-compartment 150-ton Blaw-Knox hopper is used for the sand and two sizes of coarse aggregate. Below it is a 3-beam weighing scale for batching direct to mixing trucks below. Adjoining the aggregates hopper is a 550-bbl. Blaw-Knox cement bin



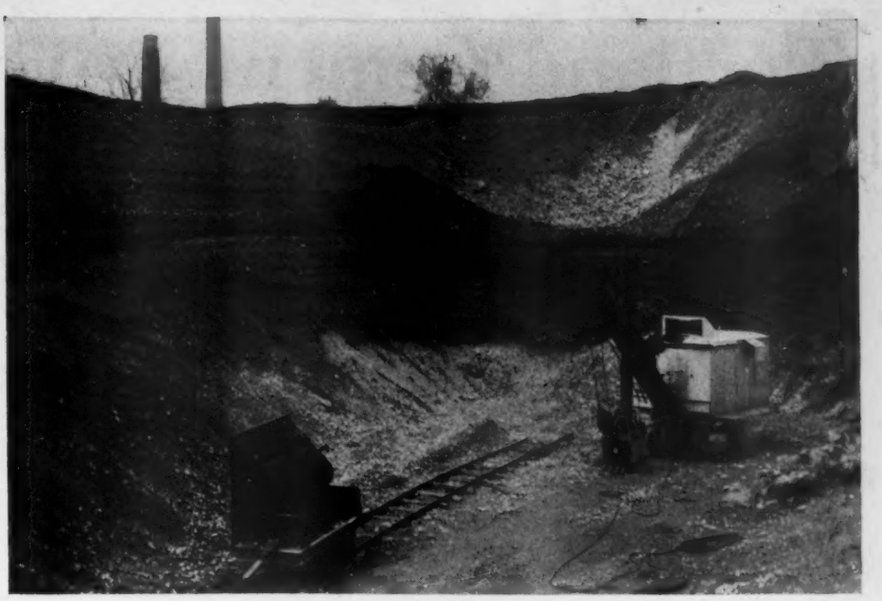


Two views of concrete batching plant, showing cement elevator at left and ramp for aggregates

with weighing batcher below. Cement is received in bulk in a Hercules special railroad car on a siding at one end of the plant where it is unloaded to the conveying and elevating equipment which transfers it to the cement bin. This transfer is accomplished by canvas spout connections between the car and two screw conveyors at ground level on each side of the track. Each conveyor has four receiving openings and discharges to a short cross conveyor below. This in turn discharges to a Sprout-Waldron steel cased bucket elevator which discharges at the top through a spout to the cement bin. The batched material is then dropped into the trucks, four Jaeger 2½-yd. mixing trucks equipped with adjustable water tanks being used for deliveries.

Aggregate Production

The sand and gravel is excavated by a Type 7, Marion caterpillar type electric shovel with a 1-yd. dipper, which loads to Easton rocker body side dump cars. These are transported to the washing and sizing plant, two cars at a time, by a 4-ton Vulcan gasoline locomotive. At a point near the plant the cars are dumped to a hopper and the material is fed from this by a reciprocating plate feeder to a Telsmith revolving bar grizzly. The oversize from the grizzly falls to a 10 E Telsmith crusher and the fines from the grizzly join the crusher discharge, both being carried up to the plant by a 24-in. by 250-ft. inclined belt conveyor. Here the material is discharged to a feed box where water is added and it then flows over two 4 by 8 ft. Niagara double-deck vibrating screens, arranged one above the other. The upper screen has 1¾-in. and 1-in. mesh wire cloth and the lower screen ⅜-in. and ¼-in. wire cloth. The oversize gravel is spouted to an additional plant alongside for recrushing, while the three gravel sizes fall to three Telsmith washing and dewatering screws and then to the bins below.



Gravel pit and electric shovel used for excavating

The sand and water flow to a drag conveyor type classifier which removes the coarse sand and the overflow passes on to a Telsmith sand settling tank where the fine sand is collected and dropped to a bin below.

The recrushing plant consists of a Kennedy reduction crusher, bucket elevator and revolving screen where four sizes of crushed gravel or stone are produced, ¼-in. stone grit, ½-in. 100% crushed, ¾-in. 95% crushed and 1¼-in. crushed. The plant is motor driven throughout.

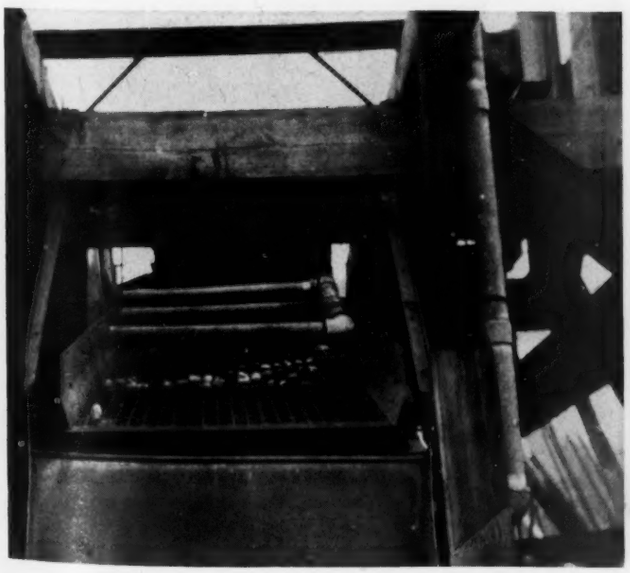
Water for washing the sand and gravel is supplied by two Worthington deep well pumps, driven respectively by a 70 hp. and 40 hp. motor. One pump is rated at 1000 gal. per min. and the other at 500 gal.

A Mead-Morrison ⅝-yd. gasoline caterpillar type shovel is used for stockpiling and stripping.

Material is being supplied by the company for the new pumping plant of the Lehigh Water Co. at Easton, on which work Collins and Maxwell, Inc., Easton, are the contractors. The company is owned and operated by Charles C. Steckel and W. L. Steckel.

Mineral Production of Canada

THE ANNUAL REPORT of the mineral production of Canada during 1930 has been published by the Dominion Bureau of Statistics. The report contains general information on all nonmetallic minerals found in Canada, together with detailed statistics on production and consumption. Data are also given on prices, capital invested, wage earners employed and world production. Cement, lime, sand and gravel, stone and sand-lime brick are included in a section on structural building materials.



One of the vibrating screens in the gravel pit

Gasoline shovel used for stockpiling and stripping

Portland Cement Production, July

THE PORTLAND CEMENT INDUSTRY in July, 1932, produced 7,659,000 bbl., shipped 9,215,000 bbl. from the mills, and had in stock at the end of the month 22,479,000 bbl. Production of portland cement in July, 1932, showed a decrease of 44.9% and shipments a decrease of 40.7% as compared with July, 1931. Portland cement stocks at mills were 13.3% lower than a year ago. The statistics here given are compiled from reports for July, received by the Bureau of Mines, from all manufacturing plants except three, for which estimates have been included in lieu of actual returns.

In the following statement of relation of production to capacity the total output of finished cement is compared with the estimated capacity of 165 plants both at the close of July, 1932, and of July, 1931.

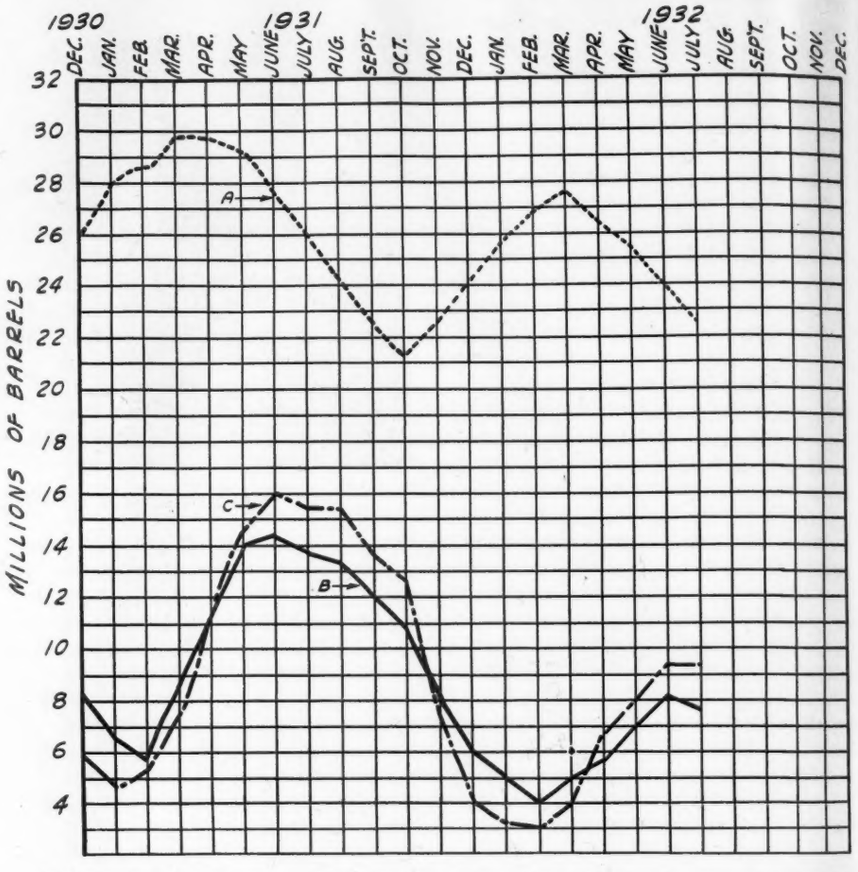
RELATION OF PRODUCTION TO CAPACITY

	July 1931	July 1932	June 1932	May 1932	April 1932
	Pct.	Pct.	Pct.	Pct.	Pct.
The month	62.0	33.4	35.7	30.2	24.8
12 months ended	53.8	34.2	36.5	38.9	41.7

Distribution of Cement

The following figures show shipments from portland cement mills distributed among the states to which cement was shipped during May and June, 1931 and 1932, and in the first six months of 1931 and 1932.

On the following page are given figures by districts, the total production, shipments and stocks and exports and imports.


1930
1931
1932
DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC. JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
MILLIONS OF BARRELS
32 30 28 26 24 22 20 18 16 14 12 10 8 6 4
A
B
C

(A) Stocks of finished portland cement of factories; (B) Production of finished portland cement; (C) Shipments of finished portland cement from factories

PORTLAND CEMENT SHIPPED FROM MILLS INTO STATES IN MAY AND JUNE, 1931 AND 1932, AND IN THE FIRST SIX MONTHS OF 1931 AND 1932, IN BARRELS*

Shipped to	1931—May	1932	1931—June	1932	First six months 1931†	First six months 1932
Alabama	183,572	26,007	138,369	30,451	909,543	193,159
Alaska	946	2,259	1,100	2,689	4,480	5,736
Arizona	42,634	15,430	41,110	16,050	257,497	88,475
Arkansas	187,370	17,496	177,846	18,623	734,020	104,874
California	628,900	400,264	646,220	461,266	3,733,806	2,477,561
Colorado	124,139	60,878	99,511	66,933	390,118	248,376
Connecticut	176,666	114,826	166,357	91,086	657,033	405,264
Delaware	47,276	38,984	51,926	34,906	173,013	139,322
Dist. Columbia	130,588	94,829	141,277	88,395	577,598	478,994
Florida	82,852	33,183	95,649	36,600	414,132	196,275
Georgia	156,532	93,256	183,317	100,778	839,179	568,686
Hawaii	25,580	26,370	22,996	23,787	147,263	125,423
Idaho	19,917	10,963	25,547	10,241	95,367	49,974
Illinois	882,739	703,571	1,069,134	815,496	3,371,090	2,186,081
Indiana	411,373	310,262	616,508	410,735	1,603,603	1,057,393
Iowa	611,996	182,684	779,351	257,084	1,926,479	675,032
Kansas	328,414	127,362	300,175	159,469	1,129,098	533,253
Kentucky	231,958	127,033	215,082	87,771	872,635	451,425
Louisiana	314,748	79,682	422,388	129,428	1,520,723	479,974
Maine	54,690	36,870	90,276	84,934	217,891	166,098
Maryland	199,360	168,539	230,317	148,637	834,944	662,358
Massachusetts	323,576	249,071	318,456	253,183	1,248,665	962,750
Michigan	659,977	304,783	842,129	488,650	2,443,326	1,254,890
Minnesota	468,010	348,504	625,439	588,156	1,578,769	1,219,218
Mississippi	82,827	14,928	82,243	21,757	316,999	115,814
Missouri	511,513	442,725	500,949	456,782	2,001,262	1,429,023
Montana	30,139	12,840	35,590	14,670	129,402	60,264
Nebraska	237,284	71,205	272,654	86,063	764,987	279,719
Nevada	10,999	47,891	11,041	74,982	52,252	206,344
New Hampshire	42,169	20,082	43,410	21,685	142,276	85,122
New Jersey	557,649	354,171	508,242	310,676	2,123,201	1,391,260
New Mexico	42,604	20,550	29,840	16,937	154,113	102,342
New York	2,013,197	1,095,796	2,498,158	1,287,121	8,351,021	4,997,825
North Carolina	146,249	52,396	163,922	30,921	599,236	253,860
North Dakota	43,024	22,113	55,251	24,936	159,594	73,539
Ohio	668,196	392,409	817,720	525,399	2,694,684	1,731,373
Oklahoma	301,925	124,276	290,304	105,703	1,213,929	620,428
Oregon	104,620	58,860	109,997	40,056	479,663	279,169
Pennsylvania	801,763	450,430	866,697	461,699	3,492,133	2,043,240
Porto Rico	3,905	4,875	17,385	4,350	28,427	23,921
Rhode Island	81,320	37,208	66,438	36,789	271,706	151,126
South Carolina	256,625	43,529	224,825	50,320	1,309,654	270,421
South Dakota	77,241	20,924	110,088	28,654	300,568	95,437
Tennessee	158,104	103,203	162,661	88,321	693,669	416,823
Texas	597,840	358,964	586,255	333,082	2,774,537	2,020,701
Utah	30,513	16,116	43,516	9,655	153,814	65,872
Vermont	24,529	25,911	42,905	38,453	102,097	89,610
Virginia	183,752	88,465	193,085	82,323	800,686	444,098
Washington	276,386	199,080	226,264	167,838	1,128,786	705,166
West Virginia	128,383	86,484	184,176	101,063	584,668	390,235
Wisconsin	431,564	227,413	569,655	394,935	1,561,114	964,135
Wyoming	17,243	10,626	19,781	10,467	69,716	36,033
Unspecified	12,082	7,406	1,246	11,394	66,155	67,880
	14,167,458	7,983,982	16,034,778	9,242,279	58,200,621	34,141,371
For'n countries	32,542	36,018	42,222	21,721	218,379	162,629
Total ship. from cem. plants	14,200,000	8,020,000	16,077,000	9,264,000	58,419,000	34,304,000

*Includes estimated distribution of shipments from 2 plants in January, 1932; from 3 plants for January, May and June, 1932, and for February to May, 1932; from 4 plants for February to April, 1931, and for June, 1932. †Revised.

PRODUCTION AND STOCKS OF CLINKER BY MONTHS, IN 1931 AND 1932, IN BARRELS

Month	1931—Production	1932	Stocks at end of month 1931	1932
January	8,129,000	6,107,000	10,384,000	8,184,000
February	7,473,000	5,176,000	11,946,000	9,375,000
March	9,586,000	5,443,000	13,318,000	10,025,000
April	11,540,000	5,924,000	13,854,000	10,511,000
May	13,159,000	6,273,000	13,087,000	9,922,000
June	12,679,000	6,803,000	11,837,000	*8,877,000
July	12,246,000	6,613,000	10,209,000	7,881,000
August	11,664,000		8,468,000	
September	10,414,000		6,918,000	
October	9,825,000		6,021,000	
November	8,259,000		6,215,000	
December	6,840,000		7,035,000	

*Revised.

PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT, BY DISTRICTS, IN JULY, 1931 AND 1932, AND STOCKS IN JUNE, 1932, IN BARRELS

District	Production 1931—July—1932		Shipments 1931—July—1932		Stocks at end of month 1931	1932	Stocks at end of June, 1932*
Eastern Penn., N. J. & Md.	2,675,000	1,162,000	3,114,000	1,741,000	6,026,000	4,553,000	5,132,000
New York and Maine	1,192,000	809,000	1,436,000	860,000	1,669,000	1,647,000	1,697,000
Ohio, West'n Penn., W. Va.	1,520,000	582,000	1,471,000	790,000	3,559,000	2,680,000	2,889,000
Michigan	983,000	571,000	1,147,000	644,000	2,208,000	2,007,000	2,080,000
Wis., Ill., Ind. and Ky.	1,877,000	1,144,000	2,275,000	1,666,000	3,518,000	2,750,000	3,272,000
Va., Tenn., Ala., Ga., Fla., La.	1,319,000	322,000	1,210,000	493,000	1,576,000	1,659,000	1,830,000
East'n Mo., Ia., Minn., S.D.	1,414,000	1,143,000	1,896,000	1,439,000	2,762,000	2,921,000	3,218,000
West'n Mo., Nebraska, Kansas, Oklahoma and Arkansas	1,015,000	789,000	1,102,000	511,000	1,624,000	1,547,000	1,269,000
Texas	646,000	278,000	696,000	307,000	626,000	667,000	695,000
Colo., Mont., Utah, Wyo., Ida.	219,000	111,000	229,000	99,000	609,000	419,000	407,000
California	670,000	584,000	624,000	510,000	1,158,000	1,049,000	975,000
Oregon and Washington	369,000	164,000	345,000	155,000	599,000	580,000	571,000
	13,899,000	7,659,000	15,545,000	9,215,000	25,934,000	22,479,000	24,035,000

PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1931 AND 1932, IN BARRELS

Month	1931—Production—1932		1931—Shipments—1932		Stocks at end of month 1931	1932
January	6,595,000	5,026,000	4,692,000	3,393,000	27,759,000	25,778,000
February	5,920,000	3,971,000	5,074,000	3,118,000	28,612,000	26,657,000
March	8,245,000	4,847,000	7,192,000	3,973,000	29,676,000	27,545,000
April	11,245,000	5,478,000	11,184,000	6,536,000	29,715,000	26,496,000
May	14,010,000	6,913,000	14,200,000	8,020,000	29,554,000	25,394,000
June	14,118,000	7,921,000	16,077,000	9,264,000	27,602,000	*24,035,000
July	13,899,000	7,659,000	15,545,000	9,215,000	25,934,000	22,479,000
August	13,549,000	.....	15,172,000	.....	24,313,000	.....
September	12,092,000	.....	13,671,000	.....	22,736,000	.....
October	10,762,000	.....	12,360,000	.....	21,218,000	.....
November	8,161,000	.....	7,156,000	.....	22,219,000	.....
December	5,974,000	.....	4,142,000	.....	24,098,000	.....
	124,570,000	.....	126,465,000	.....	.....	.....

PRODUCTION AND STOCKS OF CLINKER (UNGROUND CEMENT), BY DISTRICTS, IN JULY, 1931 AND 1932, IN BARRELS

District	1931—Production—1932		Stocks at end of month 1931	1932
Eastern Pennsylvania, New Jersey and Maryland	2,537,000	1,174,000	1,593,000	1,113,000
New York and Maine	1,047,000	640,000	940,000	599,000
Ohio, Western Pennsylvania and West Virginia	1,339,000	574,000	1,262,000	826,000
Michigan	610,000	427,000	1,049,000	1,074,000
Wisconsin, Illinois, Indiana and Kentucky	1,574,000	883,000	1,199,000	746,000
Virginia, Tennessee, Alabama, Georgia, Florida, Louisiana	1,281,000	320,000	685,000	434,000
Eastern Missouri, Iowa, Minnesota and South Dakota	1,159,000	1,032,000	710,000	505,000
Western Missouri, Nebraska, Kansas, Oklahoma, Arkansas	935,000	587,000	622,000	589,000
Texas	675,000	245,000	310,000	257,000
Colorado, Montana, Utah, Wyoming and Idaho	212,000	182,000	285,000	217,000
California	588,000	401,000	1,290,000	1,303,000
Oregon and Washington	289,000	148,000	264,000	218,000
	12,246,000	6,613,000	10,209,000	7,881,000

EXPORTS AND IMPORTS OF HYDRAULIC CEMENT, BY MONTHS, IN 1931 AND 1932

Month	1931—Exports—1932 Barrels	Value	Barrels	Value	1931—Imports‡—1932 Barrels	Value	Barrels	Value
January	41,199	$ 115,678	36,704	$ 82,984	95,609	$ 120,298	14,375	$ 16,648
February	25,703	88,989	12,889	39,350	21,984	25,391	83,706	69,197
March	54,599	144,579	39,105	81,856	70,378	80,360	19,173	17,215
April	40,478	116,564	30,123	69,451	53,333	58,576	59,392	41,487
May	48,028	140,953	31,634	71,048	19,325	20,568	9,223	7,358
June	43,597	107,610	33,134	72,084	32,079	42,955	20,963	15,496
July	29,344	97,837	.....	.....	14,332	15,582	.....	.....
August	39,517	106,643	.....	.....	8,895	11,739	.....	.....
September	27,570	81,399	.....	.....	33,574	33,520	.....	.....
October	24,531	68,524	.....	.....	39,642	42,380	.....	.....
November	33,200	97,796	.....	.....	27,940	22,235	.....	.....
December	21,887	54,028	.....	.....	40,147	34,314	.....	.....
	429,653	$1,220,600	.....	.....	457,238	$ 507,918	.....	.....

PORTLAND CEMENT SHIPPED FROM MILLS IN THE UNITED STATES IN FIRST SIX MONTHS OF 1932, WITH ESTIMATED VALUE, BY DISTRICTS

District	Shipments (first six months of 1932) Plants shipping	Quantity* (bbl.)	Estimated value
Eastern Pennsylvania, New Jersey, and Maryland	24	8,209,000	$7,810,000
New York and Maine	11	2,783,000	2,888,000
Ohio, Western Pennsylvania, and West Virginia	19	2,760,000	**2,477,000**
Michigan	13	1,721,000	1,593,000
Wisconsin, Illinois, Indiana, and Kentucky	11	3,805,000	2,843,000
Virginia, Tennessee, Alabama, Georgia, Florida, and Louisiana	19	2,789,000	3,184,000
Eastern Missouri, Iowa, Minnesota, and South Dakota	11	3,469,000	2,991,000
Western Missouri, Nebraska, Kansas, Oklahoma, and Arkansas	13	2,487,000	2,075,000
Texas	9	1,892,000	2,272,000
Colorado, Montana, Utah, Wyoming, and Idaho	9	512,000	800,000
California	10	2,957,000	4,135,000
Oregon and Washington	9	920,000	1,831,000
	158	34,304,000	$34,899,000

Exports§ and Imports†

Compiled from the records of the Bureau of Foreign and Domestic Commerce and subject to revision.

EXPORTS OF HYDRAULIC CEMENT BY COUNTRIES IN JUNE, 1932

Exported to	Barrels	Value
Canada	1,937	$ 7,315
Central America	17,147	25,008
Cuba	525	851
Other West Indies	358	931
Mexico	2,509	6,842
South America	8,888	22,926
Other countries	1,770	8,211
Total	33,134	$72,084

DOMESTIC HYDRAULIC CEMENT SHIPPED TO ALASKA, HAWAII, AND PORTO RICO, IN JUNE, 1932

	Barrels	Value
Alaska	851	$ 1,972
Hawaii	21,130	47,554
Porto Rico	4,575	5,639
Total	26,556	$55,165

*Summarized from monthly reports of the producers.

§The value of exports of domestic cement is the actual cost at the time of exportation in the ports of the United States whence they are exported, as declared by the shippers on the export declarations.

†The value of imported cement represents the foreign market value at the time of exportation to the United States.

‡Includes hydraulic cement clinker, and white nonstaining portland cement.

IMPORTS OF HYDRAULIC CEMENT BY COUNTRIES AND BY DISTRICTS IN JUNE, 1932

Imported from	District into which imported	Barrels	Value
Belgium	Porto Rico	4,043	$2,662
Canada	Montana-Idaho	1	5
Denmark	Porto Rico	11,566	8,420
Germany	Los Angeles	996	1,516
Japan	Hawaii	4,357	2,893
Total		20,963	$15,496

Editorial Comment on the Rise in Cement Prices

THE *New York Journal of Commerce* (New York City) comments in its editorial column as follows:

"Cement has recently been added to the lengthening list of commodities which have developed an upward price trend. Because of the weight per unit and the necessarily large transportation charges, cement markets are largely local, but reports from various centers in the Middle West indicate that price advances ranging from 30c. to 50c. a barrel have been announced by leading portland cement producers since the beginning of July. This advance is the more impressive because of the fact that it follows a year of practical stabilization at the lowest level since before the war, and because it has not been stimulated by any immediate flurry of demand from the construction industry.

"At the beginning of the present depression cement was aided by two favorable factors: (1) the concentration of the industry in the hands of a few large companies, and (2) the fact that cement is used largely for road building, which was maintained at a relatively high level by federal, state and local governments as an aid to employment. These advantages were partly offset by the fact that the industry during the long building boom had developed a substantial excess of plant capacity and that, consequently, many companies were anxious to maintain volume of production at the expense of prices. As a result, when orders declined in the first half of 1931 and governmental organizations insisted on competitive bids for all contracts, the portland cement companies bid against one another for the reduced volume of business and a rapid series of cuts in listed prices were announced. The last of these cuts occurred in May, 1931, and a year of profitless stabilization followed.

"The price reductions in the first half of 1931 were accompanied by an accumulation of surplus stocks, which the industry has made a vigorous effort to reduce. As a result production has been sharply curtailed and stocks have gradually tended lower."

Will Reopen Graphite Mines

THE GRAPHITE MINES in Clay county, N. C., which have been closed down for more than a year, will reopen within the next 60 days, giving employment to more than 200 men. The mines and smelter which are located at Lineville, N. C., were recently purchased by a group of New York and Chicago capitalists.

The Rock Products Market

Wholesale Prices of Aggregates

(F.O.B. Plant or City Designated)

Prices given are for crushed limestone per ton, unless otherwise stated

	Crushed stone		Sand	Gravel,	Slag	
	Screenings, ¼ in. down	½ in. and less to 2½ in	¼ in. and less	½ in. and less to 2 in.	Screenings, ¼ in. down	Crushed, ½ in. and less to 3 in. and larger
EASTERN:						
Albany, N. Y. (u)			.90*	1.35*		
Alexander, N. Y.			.65d	.65d		
Boston, Mass. (g)			1.05	1.60		
Buffalo, N. Y.	1.25¶	1.25¶	1.00–1.10d	1.00–1.10d	1.50d	1.50–1.60d
Clarence, N. Y.			.60v	.60v		
Hillsville, Penn.	.85	1.25				
Montoursville, Penn.			.60	.50		
New York City			1.00*	1.50*		
Philadelphia, Penn. (trap rock)	2.16–3.51	2.36	1.35	1.50		
Utica, N. Y.	.50– .75	.75–1.00	.50– .75	.60–1.00		
Washington, D. C.			.85	1.30		
CENTRAL:						
Alton, Ill.	1.75					
Chicago, Ill.			.23	.42		
Davenport, Iowa	1.00	1.25				
Dubuque, Ia.	1.00	1.00				
Eau Claire, Wis.			.30– .35	.45– .80		
Greenbush, Mich.			.40x	.70y		
Grand Rapids, Mich.			.30	.60		
Hannibal, Mo.	1.00	1.25				
Indianpolis, Ind.			.25– .50	.50– .70		
Merom, Ind.			.30– .40	.50– .70		
Middle Brook, Mo. (granite)	2.50–3.00	1.75–2.25				
Milwaukee, Wis. (w)	1.14	1.24	.74	.84		
Stone City, Iowa	.75	1.00				
St. Louis and Maplewood, Mo.	1.00	1.00				
St. Paul, Minn.	.75	1.25				
Toledo, Ohio	1.16	1.66			1.10	1.20
Waukesha, Wis.	.80	.90	.40	.55		
SOUTHERN:						
Birmingham and Ensley, Ala.					.55	.80–1.25
Chico, Tex.	.50u	1.00u				
(Trap rock)	2.25u	1.00u				
Columbia, S. C. (granite)	.50	1.40				
Ft. Spring, W. Va.	.35	1.00–1.35q				
Ft. Worth, Tex.			.75	1.10		
Houston, Tex.			1.25*	1.81k		
Knoxville, Tenn.	.50	.75	.60–1.00	.80–1.20		
Lithonia, Ga. (granite)	.25	.85				
Longdale, Va.					.75	1.05–1.25
Montgomery, Ala.			.30– .40	.50– .60		
Olive Hill, Ky.	.50	.90				
Roseland, La.			.50	.80		
San Antonio, Tex.	1.10	1.20				
Woodward, Ala.					.55‡	.90–1.25‡
WESTERN:						
Denver, Colo. (h)			1.25*	1.75*		
Dolomite, Calif.	3.30					
Ft. Gibson, Okla.				.80s		
Phoenix, Ariz. (n)			1.65	1.50		
Salt Lake City, Utah			.60‡	.60‡		
San Francisco, Calif.			1.30k	1.30k		
Tulsa, Okla.	.72ra	1.15–1.27r	¶.25– .40d			

*Prices per cu. yd. ¶F.o.b. cars. †Less 10c per ton monthly settlements disc. ‡Prices less 5c dis. per ton for payment 15th following month. (a) ¾-in. and 1-in., disc. 10c ton 10 days. (b) ½-in. to 1½-in. (c) 1½-in. and less. (d) F.o.b. trucks at plant. (e) Delivered in truck loads. (f) ¾-in. to 2½-in. (g) Delivered to job by truck, Boston. (h) Pea gravel, per cu. yd., 1.15. (k) Less 10c cash disc. (m) 2-in. and less. (n) Per cu. yd. in city limits. (p) Loaded on cars, per ton at plant. (q) ½-in., 1.35; 1-in., 1.15; 1-in. to 2½-in., 1.00. (r) Less 15c per ton for cash 10 days. (s) ¼-in. to 1½-in. washed river gravel, 80c per ton; ¾-in. to 2¼-in., 70c per ton. (u) F.o.b. plant. (v) F.o.b. cars or trucks. (w) Sand and gravel also at 1.00–1.35 per cu. yd. (x) Concrete sand. (y) Washed pebble, 70c; road gravel, 1½-in., per ton, 50c; ¾-in., 35c.

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point.

Chester, Vt.—Finely ground talc (carloads), Grade A—99-99½% thru 200 mesh, 7.50–8.00; Grade B, 97-98% thru 200 mesh 6.50– 7.00
1.00 per ton extra for 50-lb. paper bags; 166⅔-lb. burlap bags, 15c each; 200-lb. burlap bags, 18c each. Credit for return of burlap bags. Terms 1%, 10 days.

Emeryville, N. Y.:
Crude ground talc (200 mesh), bags.. 13.75
Crude ground talc (325 mesh), bags.. 14.75

Natural Bridge, N. Y.:
Ground talc (325 mesh), in 50-lb., 100-lb. and 200-lb. bags, per ton 10.00–20.00

Roofing Slag

Prices given are per ton f.o.b. city named.

Buffalo, N. Y.	2.50†
Ensley and Birmingham, Ala.	2.05
Erie and DuBois, Penn.	2.50†
Longdale, Va.	2.50
Toledo, Ohio	1.20¶
Woodward, Ala.	2.05*

*Less 5c ton disc. for pay. 15th following month. †Price f.o.b. trucks at plant, subject to discount of 10c per ton for payment on or before the 15th of following month. ¶F.o.b. trucks, slag plant.

Pulverized Limestone for Coal Operators

Davenport, Ia.—Analysis, 90-98% $CaCO_3$; 2% and less $MgCO_3$; 100% thru 20 mesh, 50% thru 200 mesh; sacks, ton..	6.00
Waukesha, Wis.—90% thru 100 mesh.....	4.05

Agricultural Limestone

(Crushed)

Alton, Ill.—90% thru 100 mesh.....	4.50
Chico, Tex.—Pulverized limestone, per cwt., sacked ..... $20.00 per ton, l.c.l.	1.00
Colton, Calif.—Analysis, 95.97% $CaCO_3$; 1.31% $MgCO_3$ all thru 14 mesh down to powder	3.50
Davenport, Iowa — Analysis, 90-98% $CaCO_3$; 2% and less $MgCO_3$; 90% thru 4 mesh; bulk.....	1.00
Dolomite, Calif.—Analysis, 54.25% $CaCO_3$; 44.45% $MgCO_3$; 99% thru 10 mesh, per ton, 2.10; 49% thru 60 mesh, ¼-in. to dust, per ton.....	1.70
Dubuque, Ia.—Analysis, 64.04% $CaCO_3$; 29.54% $MgCO_3$; 90% thru 50 mesh, per ton	1.00
Fort Spring, W. Va.—Analysis, 90% $CaCO_3$; 3% $MgCO_3$; 50% thru 100 mesh, per ton, bulk, 1.15; in 80-lb. bags	2.75
Gibsonburg, Ohio—99% thru 10 mesh, 60% thru 100 mesh; in bags, per ton, 3.50; in bulk, per ton.....	2.50
Agricultural meal, 100% thru $\frac{3}{16}$-in. mesh screen, 25% thru 100 mesh screen, ton	1.00
Hillsville, Penn. — Agricultural, ground, 45% thru 100 mesh, bulk, per ton, 1.35; pulverized limestone, per ton, bulk, 2.50; in bags.....	3.25
Knoxville, Tenn.—80% thru 100 mesh, 1.50; 80% thru 200 mesh, per ton..... Bags, 1.00 extra.	2.50
Lannon, Wis.—50% thru 100 mesh.....	1.50
Marion, Va.—Analysis, 80% $CaCO_3$; 20% $MgCO_3$; per ton.....	1.00
Olive Hill, Ky.—90% thru 4 mesh.....	1.00
Osborne, Penn.—100% thru 20 mesh; 60% thru 100 mesh, and 45% thru 200 mesh, per ton.....	3.25
Stone City, Ia.—Analysis, 98% $CaCO_3$; 50% thru 50 mesh.....	.75
Waukesha, Wis.—90% thru 100 mesh, per ton, 4.05; 50% thru 100 mesh.....	2.10

Chicken Grits

Chico, Tex.—(Limestone) packed in 100-lb. sacks, per cwt., f.o.b. plant....	1.00
Davenport, Iowa—High calcium carbonate limestone, in bags, L.C.L., per ton	6.00
Dolomite, Calif.—(Limestone), special size, in 50-ton cars, yellow, per ton..	10.00
White, per ton.....	9.00
Gibsonburg, Ohio.—(Agstone)	5.00– 5.25
Hannibal, Mo.—(Limestone), per ton..	8.00
Los Angeles, Calif.—Marble grits, per ton, incl. sacks.....	7.50–12.50
Maplewood, Mo.—(Limestone), per ton	10.00
Middlebury, Vt.—Per ton (a).....	10.00
New York City—Per cu. yd.....	1.00
Port Clinton, Ohio—(Gypsum), per ton	6.00
Salt Lake City, Utah—Per ton.....	.60
Tuckahoe, N. Y. (aggregate) per ton....	5.00
Utica, N. Y.—(Limestone), per ton.....	3.50
Warren, N. H.—(Aggregate).....	7.80–11.00
Waukesha, Wis.—(Limestone), per ton (a) F.o.b. Middlebury, Vt.	7.00

Mica

Prices given net, f.o.b. plant or shipping point.

Martinsville, Va.—Mine scrap, per ton.....	10.00
Clean scrap, per ton.....	15.00
Penland, N. C.—Mine scrap, per ton, 12.00; clean shop scrap, per ton, 16.00; roofing mica, per ton.....	16.00
Franklin, N. C.—Ground mica, 20 mesh, 21.00; 40 mesh, 22.00; 60 mesh, 35.00; 100 mesh	42.00

Portland Cement

	F.o.b. city named Per Bag	Per Bbl.	High Early Strength
Albuquerque, N. M.	.84½	3.38.	.....
Boston, Mass.	.49¼	1.97†	2.87¶
Cedar Rapids, Ia.	.53½	2.14	.....
Cheyenne, Wyo.	.52¼	.....	.....
Chicago, Ill.	.....	1.50†	2.40¶
Cincinnati, Ohio	.....	1.42†	2.32¶
Cleveland, Ohio	.....	.....	1.93¶
Columbus, Ohio	.....	1.41†	2.31¶
Dallas, Tex.	.....	1.85	.....
Davenport, Ia.	.50¾	2.03	.....
Dayton, Ohio	.....	1.27†	2.17¶
Denver, Colo.	.55	.....	.....
Detroit, Mich.	.....	1.47†	2.47¶
Houston, Tex.	.....	1.95	.....
Indianapolis, Ind.	.....	1.50†	2.40¶
Jacksonville, Fla.	.....	2.30†	.....
Kansas City, Mo.	.48½	1.94	.....
Los Angeles, Calif.	.57½	2.30	.....
Louisville, Ky.	.....	1.44†	2.34¶
Memphis, Tenn.	.....	1.77†	2.82¶
Milwaukee, Wis.	.....	1.67†	2.57¶
Minneapolis, Minn.	.55¼	2.21	.....
Montreal, Que.	.....	1.70§	.....
New Orleans, La.	.65	2.60	.....
New York, N. Y.	.37½	1.49†	2.39¶
Okla. City, Okla.	.60	2.40	.....
Omaha, Neb.	.57½	2.30	.....
Portland, Ore.	.....	‡2.45–2.55	.....
Reno, Nev.	.....	2.80‡	.....
St. Louis, Mo.	.....	1.54†	2.44¶
St. Paul, Minn.	.55¼	2.21	.....
San Francisco, Calif.	.....	2.05‡	.....
Seattle, Wash.	.....	2.30–2.55	2.80c
Tampa, Fla.	.....	†2.05	.....
Toledo, Ohio	.....	1.10†	2.00¶
Topeka, Kan.	.53¾	2.15	.....
Tulsa, Okla.	.55½	2.22	.....
Mill prices f.o.b. in carload lots, without bags, to contractors.			
Buffington, Ind.	.....	1.25†	.....
Dallas, Tex.	.....	1.75	.....
Duluth, Minn.	.....	1.45†	.....
Hannibal, Mo.	.....	1.25†	.....
Houston, Tex.	.....	1.85	.....
Hudson, N. Y.	.....	1.50†	2.33¶
Humboldt, Kan.	.....	1.25	.....
Independence, Kan.	.....	1.35†	.....
Leeds, Ala.	.....	1.60†	.....
Lime & Oswego, Ore.	.....	2.55	.....
Limedale, Ind.	.....	1.65‖	2.15¶
Northampton, Penn.	.....	1.40†	.....
Universal, Penn.	.....	1.21†	.....
Waco, Tex.	.....	1.75†	.....

NOTE: Unless otherwise noted, prices quoted are net prices, without charge for bags. Add 40c per bbl. for bags. †Subject to 10c cash discount. ‡Subject to dealers' commission of 10c per bbl. ¶"Incor" Perfected, prices per bbl. packed in paper sacks, subject to 10c discount 15 days. (c) Quick-hardening "Velo," packed in paper bags, 10c discount 10 days. §Sales tax included at 6%. ‖Gross, in cloth.

Special Aggregates

Prices are per ton f.o.b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco-chips
Brandon, Vt.—English pink, cream and coral pink (a)	¶12.50–‖14.50	¶12.50–‖14.50
Cardiff, Md. — Crushed green marble (a)	¶12.50–‖14.50	¶12.50–‖14.50
Crown Point, N. Y.—Per ton	12.00	12.00
Dolomite, Calif. (Lone Pine)—(a)		
White	‖9.00	‖9.00
Snowflake	.....	‖9.00
Middlebrook, Mo.	.....	20.00– 25.00
Middlebury, Vt.—White	¶9.00–‖10.00a	.....
Randville, Mich.—Crystalite, crushed white marble, bulk	4.50	4.50– 5.00
Warren, N. H., per ton	.....	3.00– 5.00

¶C.L. ‖L.C.L. *Per 100-lb. (a) Including bags.

Art and Cast Stone Aggregates

Cardiff, Md.—Green marble fines in carloads; bulk, 7.50; in bags..... 10.00

Los Angeles, Calif.—Dolomite aggregates, all sizes, white† ¶7.30 ‖9.50

Dolomite special cast stone, wet-cast aggregate, white, ¼-in. to dust a5.10

† 100-lb. sacks. ¶C.L. ‖L.C.L. (a) In open cars.

Masonry Cement

Packed in paper sacks. Prices, f.o.b. cities named, include cost of sacks.

	Per bag	Per bbl.
Cincinnati, Ohio	.41½	1.66
Columbus, Ohio	.43	1.72
Dayton, Ohio	.42¼	1.69
Indianapolis, Ind.	.40½	1.62
Louisville, Ky.	.38½	1.54
Memphis, Tenn.	.46¾	1.87
St. Louis, Mo.	.43¾	1.75
Toledo, Ohio	.44¼	1.77

Miscellaneous Sands

City or shipping point	Roofing sand	Traction
Eau Claire, Wis.	.....	.60
Niles, Ohio	1.40	1.40
San Francisco, Calif.	3.50–5.00	3.50

ROCK PRODUCTS solicits volunteers to furnish accurate price quotations.

Potash Feldspar

East Liverpool, Ohio—Color, white; analysis, K_2O, 10.30%; Na_2O, 2.70%; SiO_2, 68%; Fe_2O_3, 0.08%; Al_2O_3, 18%; pulverized, 99% thru 200 mesh, per ton, in bulk, 18.85; in bags..... 20.00

Erwin, Tenn.—Color, white; analysis, K_2O, 10.30%; Na_2O, 2.70%; SiO_2, 68%; Fe_2O_3, 0.08%; Al_2O_3, 18%; pulverized, 99% thru 200 mesh, per ton, in bulk, 14.50; in bags..... 15.70

Spruce Pine, N. C.—(Chemically controlled.) Color, white; 200 mesh; analysis, K_2O, 11.30%; Na_2O, 2%; SiO_2, 67%; Fe_2O_3, 0.10%; Al_2O_3, 18%; per ton, in bulk..... 15.00

West Paris, Me. — (Chemically controlled.) Color, white; 200 mesh; analysis, K_2O, 11.20%; Na_2O, 3.20%; SiO_2,65.70%; Fe_2O_3, 0.09%; Al_2O_3, 19.20%; per ton, in bulk..... 19.00

Soda Feldspar

Spruce Pine, N. C.—(Chemically controlled.) Color, white; 200 mesh; analysis, K_2O, 5.50%; Na_2O, 5.50%; SiO_2, 68.80%; Fe_2O_3, 0.10%; Al_2O_3, 18.60%; per ton, in bulk..... 18.00

Fullers Earth

Prices per ton in carloads, f.o.b. Florida shipping points. Bags extra and returnable for full credit.

16– 30 mesh	20.00
30– 60 mesh	22.00
60–100 mesh	18.00
100 mesh and finer	9.00
Joliet, Ill.—All passing 100 mesh, f.o.b. Joliet, including cost of bags	22.00

Whiting

St. Louis, Mo., per ton..... 15.00*

Chicago, Ill., prices per ton.

Domestic putty whiting	10.00–12.00
Domestic precipitated whiting	15.00–20.00
Imported bolted whiting	30.00–35.00

*Packed in bbl., f.o.b. St. Louis.

Glass Sand

(Silica sand is quoted washed, dried and screened)

Niles, Ohio (Dried, per ton)	2.35
Ottawa, Ill.—(Per ton, f.o.b. Ottawa)	1.25
San Francisco, Calif.	4.00–6.00
South Vineland, N. J.	1.50

Core and Foundry Sands

Silica sand quoted washed, dried, screened unless otherwise stated; lowest net prices per ton f.o.b. plant

City or shipping point	Molding Fine	Molding Coarse	Molding Brass	Core	Furnace lining	Sand blast	Stone sawing
Albany, N. Y.	1.65	1.65	1.65	.....	.....	3.00	.....
Eau Claire, Wis.	.....	.....	.....	.....	.....	2.25e	.....
Elco, Ill.	Amor. silica, 90-99½% thru 325 mesh,						$10.00
Montoursville, Penn.	.....	.....	.....	1.50a	.....	.....	.....
New Lexington, Ohio	2.00	1.25	.....	.....	.....	.....	.....
Niles, Ohio	1.40	1.40	.....	1.40	1.40	1.40	.....
Ottawa, Ill.	.....	.....	.....	.....	.....	3.50	.....
San Francisco, Calif. (f)	3.50	5.00	3.50	2.50c	5.00	3.00d	1.75e

South Vineland, N. J.—Dry white silica, 2.00 per ton.

(a) To 1.60. (c) To 4.50 per ton. (d) To 5.00. (e) To 2.50. (f) Ground sand, 120-200-325 mesh, per ton, 16.50.

Lime Products

(Lowest carload prices per ton f.o.b. shipping point unless otherwise noted)

	Finishing hydrate	Masons' hydrate	Agricultural hydrate	Chemical hydrate	Ground burnt lime, Bulk	Ground burnt lime, Bags	Lump lime In bulk	Lump lime In bbl.
EASTERN:								
Buffalo, N. Y.	5.50	4.75	4.75	10.50	5.00	7.00	5.00	.....
Cedar Hollow, Devault, Rambo and Swedeland, Penn.	.....	8.00c	8.00c	8.00c	7.00	8.00	8.00	.....
Lime Ridge, Penn.	.....	.....	8.00	.....	6.00	7.00	4.50	.....
CENTRAL:								
Cold Springs, Ohio	.....	.....	4.75	.....	.....	.....	5.00	.....
Martin, Gibsonburg, Marblehead, Tiffin, Ohio, and Huntington, Ind.	5.50	4.75	4.75	10.00	5.00	7.00	5.00	14.00
Delaware, Ohio	5.50	4.75	4.75	6.50	.....	.....	5.50	.....
Woodville, Ohio	5.50	4.75	4.75	.....	5.00	7.00	5.00	14.00
SOUTHERN:								
Cartersville, Ga.	.....	7.50	.....	.....	.....	.....	.....	.....
Keystone, Ala.	12.00	7.50	7.50	7.50	.....	.....	6.50§	.....
Knoxville, Tenn.	.....	7.50	6.50	7.50	.....	.....	4.50b	12.50
WESTERN:								
Kirtland, N. Mex.	.....	.....	.....	.....	.....	.....	12.50d	.....
Little Rock, Ark.	.....	12.05	.....	10.60	.....	.....	10.10	17.10

(a) In 100-lb. bags. (b) To 6.50. (c) In 50-lb. paper. (d) To 15.00. §In barrels, 1.25 per bbl.

Wholesale Prices of Slate

Lowest prices f.o.b. at producing point or nearest shipping point

Slate Flour

Pen Argyl, Penn.—Screened, 200 mesh, 6.00 per ton, in paper bags.

Slate Granules

Pen Argyl, Penn.—Color, blue-black, per ton..... 5.75*

*In 150-lb. burlap bags, plus 10c for each bag.

Roofing Slate

Prices per square—Standard thickness

City or shipping point	3/16-in.	¼-in.	⅜-in.	½-in.	¾-in.	1-in.
Bangor, Penn.—						
No. 1 Bangor	9.50	14.00	20.00	24.00	35.00	45.00
No. 1 Ribbon	7.50	10.00	15.00	20.00	30.00	40.00
Chapman Quarries, Penn.—						
Smooth texture	8.00– 8.75	.....	.....	.....	.....	.....
Rugged	9.00–10.50	a11.00	b16.00	c18.50	d22.00	e27.00
Pen Argyl, Penn.	.....	9.00	13.00	15.00	20.00	26.00

Albion blue-grey roofing slate. No. 1 clear 5.50–6.50; mediums, 5.50–6.00; No. 1 ribbon, 5.50–6.00; punching, all sizes 25c per square.

(a) To 14.00. (b) To 18.00. (c) To 22.00. (d) To 28.00. (e) To 33.00.

Concrete Block

Prices given are net per unit, f.o.b. plant or nearest shipping point.

Camden, N. J.:
4x8x16 in., each..... .10 6x8x16 in., each..... .13
8x8x16 in., each..... .16 12x8x16 in., each..... .23
Prices less 10% payment 10 days.

Lexington, Ky.:
8x8x16 in. 16.00*
*Price per 100 at plant.

Cement Drain Tile

Longview, Wash.—Price per foot.

3-in.	.05	8-in.	.14
4-in.	.06	10-in.	.18
6-in.	.10	12-in.	.22

Cement Building Tile

Lexington, Ky.:	
5x8x12, per 1000	55.00
4x5x12, per 1000	30.00
Longview, Wash.:	
4x6x12, per 100	5.00
4x8x12, per 100	6.00

Concrete Brick

Prices given per 1000 brick, f.o.b. plant.

	Common	Face
Longview, Wash.	16.50	†22.00
Milwaukee, Wis.	12.50	18.00

†And higher.

Rock Phosphate

Prices given are per ton (2240 lb.) f.o.b. producing plant or nearest shipping point.

Lump Rock

Mt. Pleasant, Tenn. — B.P.L., 75%, screened machine lump, per ton, 6.25; hand mined kiln lump 4.00– 6.00
Fernandina, Fla.—B.P.L., 77%, per ton 6.50

Ground Rock
(2000 lb.)

Mt. Pleasant, Tenn.—
Ground rock, B.P.L. 72½% (33% phosphoric acid), per ton in bulk, 11.00; in paper bags, 12.50; in cotton bags 13.25
Ground rock, B.P.L. 72%, per ton.... 4.75– 5.25

Current Prices Cement Pipe

Prices are net per foot f.o.b. cities or nearest shipping point in carload lots unless otherwise noted

Culvert and Sewer	4-in.	6-in.	8-in.	10-in.	12-in.	15-in.	18-in.	20-in.	22-in.	24-in.	27-in.	30-in.	36-in.	42-in.	48-in.	54-in.	60-in.
Longview, Wash. (a)																	
Culvert	.....	.30	.45	.....	.55	.....	1.05	.....	.....	1.54	.....	2.70	4.00	5.00	6.00	.....	.....
Sewer	.17½	.21	.30	.42	.45	.90	1.26	.....	.....	2.16	.....	3.60	.....	.....	.....	.....	.....
Mercedes, Tex.																	
Irrigation	.....	.16	.19	.24	.29	.40c	.60	.74	.....	1.13	.....	1.77	.....	.....	.....	.....	.....
Wahoo, Neb.	12-in., 15-in., 18-in., 24-in., and from 30-in. to 60-in. pipe, per ton, 10.00																

(a) List less 40%. (c) 14-in. pipe; 16-in. pipe, 50c.

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F.O.B. MILL

City or shipping point	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gaging Plaster	Wood Fiber	Gaging White	Plaster Sanded	Cement Keene's	Finish Trowel	—Plaster Board— ¼x32x 36". Per M Sq. Ft.	⅜x32x 36". Per M Sq. Ft.	Wallboard, ⅜x32 or 48" Lengths 6'-10'. Per M Sq. Ft.
Grand Rapids, Mich.	.....	1.50	7.00	.....	10.00	10.00	19.50	8.00	26.00	21.00	15.00	15.00	27.00
Los Angeles, Calif. (r)	.....	.....	8.02p	.....	12.40q	.....	13.40a	.....	.....	.....	.....	.....	.....
Medicine Lodge, Kan.	1.25	8.00b	.....	.....	.....	.....	11.50b	.....	16.00b	.....	.....	.....	.....
Port Clinton, Ohio	4.00	6.00–8.00	6.00–8.00	10.00m	10.00n	10.00n	20.00k	8.00–11.00	24.50f	26.00g	15.00h	15.00h	27.00j

NOTE—Returnable bags, 10c each; paper bags, 1.00 per ton extra (not returnable. (a) To 15.40 per ton. (b) Includes paper bags. (c) Includes jute sacks. (f) To 27.50. (g) To 29.00. (h) To 16.00. (j) To 28.00. (k) To 23.00. (m) To 12.00. (n) To 13.00. (p) To 9.02. (q) To 14.40 per ton. (r) Plaster board, 16x48—⅝ in., per yd., 14½c; 16x48—⅜ in., per yd., 16½c.

Gypsum, Lime and Alabastine (Canada) Ltd. Awake to Empire Opportunities

NEGOTIATIONS are now in progress which may result in the widening of sales facilities in the United Kingdom for Gypsum, Lime and Alabastine (Canada), Ltd. No details have been made as to these overtures, but they are understood to be of considerable importance to Gypsum, Lime.

It is learned that during the first six months of the current year sales of Gypsum, Lime have decreased approximately 30% from those reported during the corresponding period of last year. An important feature of sales this year, however, is that exports, instead of registering a decline, have recorded an appreciable increase.

Having in mind the marked decrease in Canadian building activity, the company has more than maintained its competitive sales position in the domestic market, and with the substantial reductions in operating expenses which have been made, current earnings are not unfavorable.

No details are available as to the trend of earnings this year other than that they are running somewhat behind those reported for the first half of 1931. During the whole of last year net earnings totaled $551,606. After providing for bond interest, depreciation, income tax and all other senior charges, there remained a net profit of $39,237. Dividends paid during the year amounted to $225,396, leaving a deficit of $186,159 charged against previous surplus.

In view of the necessity of conserving cash position, the management deferred dividends on the common stock at the beginning of the year. This policy has enabled the company to maintain a good cash position to date. The last balance sheet showed a small bank loan of $35,000 on behalf of its subsidiary, the Crystalite Co. It is understood that the position in relation to bank loans continues favorable.

At the moment there does not appear to be any immediate resumption of building activity in the domestic field. There are a number of small jobs in the way of renovations, but construction on a large scale is limited.

It is unlikely that sales in the balance of the year will make any material difference in the company's operating or financial position. With a renewal of confidence and the extension of markets as a result of the present Empire Economic Conference, however, it is likely that next spring will see sales conditions on a better plane.

Look to Waterways

Meanwhile announcement of the St. Lawrence Waterways treaty has drawn attention to possible benefits which may accrue to manufacturers of cement, gypsum and other building materials. Gypsum, Lime anticipates doing a substantial volume of business if this project goes ahead. The company possesses limestone quarry properties adjacent to the International waterways section and will be able, in addition, to supply large quantities of manufactured materials as well.

No major capital expenditures have been carried out by the company this year. In 1931 Gypsum, Lime spent over $100,000 on the electrification of the Beachville limestone quarries, which had the effect of reducing production costs by at least 25c. a ton. In addition about $60,000 was expended on washing and loading equipment at the St. Emilie, P. Q., sand plant.

At present the company's manufacturing plants are equipped for low-cost production, and the management anticipates better returns when conditions undergo an improvement.

Marked interest in the stock of Gypsum Lime has been quiet of late. There is a good undertone, however, and steady absorption of the stock at around 3. Other stocks in this group occupy much the same position, and investors show an apathy toward them. With a definite improvement in building activity more interest will likely be shown in the securities of building material manufacturers. — *Financial Post* (Toronto, Ont.).

Pennsylvania Caves

A REPORT on the limestone caves in Pennsylvania has been published by the Department of Internal Affairs. A description of the caves and of their commercial development is given of all known caves of relative importance in the state. Many illustrations are included which show some of the more interesting peculiarities encountered.

Current Prices of Ready-Mix Concrete

BELLINGHAM, WASH.—Prices per cu. yd.¶

Mix	Retail, f.o.b. bunkers	In carloads	Mix	Retail, f.o.b. bunkers	In carloads
1–3–4	6.85	6.10	1–2–3	7.65	6.91
1–3–5	6.45	5.75	1–2–4	7.05	6.50

¶Additional charges for delivery to various zones. First zone, added charge of 75c per cu. yd.; second zone, added charge of $1.05; third zone, added charge of $1.40; fourth zone, added charge of $1.75.

BOSTON AND CAMBRIDGE, MASS.—Price per cu. yd. for orders of 30 cu. yd. and over.‡

Mix		Mix	
1–2 –4	6.50	1–1½–3	7.05
1–3 –6	6.00	1–1 –2	7.80
1–2½–5	6.25	1–2	9.50
1–2 –3	6.95		

‡Discount of 50c per cu. yd. allowed on deliveries made between the 1st and 15th of the month if bill is paid on or before the 25th and on deliveries made between 15th and 30th if paid on or before the 10th of following month.

CHAMPAIGN, ILL.†—Prices per ton (weight, 4000 lb. per cu. yd.)

Mix		Mix	
1–2–3	3.50	1–3–5	3.25
1–2–4	3.37½		

†Discount to contractors. Prices subject to cash discount of 5% for payment by 10th of month following delivery.

CLEVELAND, OHIO (a)—Prices per cu. yd. to contractors.

Public Square basing point

Aggregate: Limestone

Mix	1st mile	Mix	1st mile
1–1 –2	7.00	1–2½–5	5.50
1–2 –3	6.00	1–3 –5	5.40
1–2½–3	5.90	1–3 –6	5.30
1–2 –4	5.80	1–4 –8	5.15
1–2½–3½	5.80	1–2 Finish	7.00
1–2½–4	5.65	1–2½ Finish	6.50
1–3 –4	5.60	1–3 Finish	6.00

Basing point: Windfall Road and Broadway, Bedford, Ohio

Aggregate: Bedford gravel

Mix	1st mile	Mix	1st mile
1–1 –2	6.50	1–2½–5	5.00
1–2 –3	5.50	1–3 –5	4.90
1–2½–3	5.40	1–3 –6	4.80
1–2 –4	5.30	1–4 –8	4.65
1–2½–3½	5.30	1–2 Finish	7.00
1–2½–4	5.15	1–2½ Finish	6.50
1–3 –4	5.10	1–3 Finish	6.00

(a) Add 20c per yd. to above prices for each additional mile up to four miles; beyond this, for each additional mile add 10c per yd. On orders of 50 yd. or more, contractors quoted 50c per yard less. No discount for quantity to industrials or consumers. On orders of less than 10 yd. to the one-time buyer class, add $1 per yard. Extra charge for concrete delivered nights, Sundays or holidays, $1 per yard over daytime schedule. For high-early-strength or waterproofing cements, add $2 per yard. Minimum delivery, 1 yd. Prices quoted are based upon normal discharge of the load within 20 minutes after arrival of truck. A demurrage charge of $1 will be made for each 15 minutes thereafter.

DALLAS, TEX.†

	Slump				Slump		
Strength	½ in. to 1 in.	3 in. to 4 in.	6 in. to 7 in.	Strength	½ in. to 1 in.	3 in. to 4 in.	6 in. to 7 in.
1500	5.25	5.45	5.75	2500	5.80	6.00	6.30
2000	5.55	5.75	6.05	3000	6.15	6.45	6.75

Fixed Mixes (any slump)

1–2½–5	6.45	1–2–4	6.75	1–1½–3	7.45

†Prices subject to 2% 15 days and are based on quantities of 50 to 999 cu. yd. and on delivery in 2½-cu. yd. loads within Zone 1, which extends about 1½ miles from either of two plants. Zone charges are approximately 10c per cu. yd. per mile beyond the Zone 1 limit. On quantities under 50 cu. yd. add 20c and on quantities over 1000 cu. yd. deduct 30c.

FAIRMONT, W. VA.—Prices per cu. yd. (c)

Mix	Quantity	Delivered	Called for
1–2–4	Less than 1 cu. yd.	11.00	10.00
1–2–4	From 1 to 4 cu. yd.	10.00	9.00
1–2–4	From 5 to 10 cu. yd.	9.50	8.50
1–2–4	From 11 to 49 cu. yd.	9.00	8.00
1–2–4	From 50 cu. yd. and up	8.50	7.50

(c) For 1–2–3 mix add 50c per cu. yd. to prices quoted; for 1–3–5 mix deduct 50c per cu. yd. from prices quoted.

SANTA CRUZ, CALIF.—Price per cu. yd. delivered within two-mile radius of plant. (l)

Mix	Over 5 cu. yd.	Less than 5 cu. yd.	Mix	Over 5 cu. yd.	Less than 5 cu. yd.
1–6 (6 sacks cement)	8.50	9.00	1–8 (4½ sacks cement)	7.60	8.10
1–7 (5 sacks cement)	8.00	8.50	1–9 (4 sacks cement)	7.40	7.90

(l) For deliveries outside of this area add 30c per cu. yd. per mile. Cash discount of 50c per cu. yd. if paid in full by 10th day of following month.

MEMPHIS, TENN.—Prices per cu. yd. delivered in city.†

Strength	Portland	"Incor"	Strength	Portland	"Incor"
1800 lb.	6.50	7.30	3000 lb.	8.00	9.25
2000 lb.	7.00	8.00	3500 lb.	8.60	10.00
2500 lb.	7.50	8.50	4000 lb.	9.80	11.75

†Above prices based on gravel for aggregate. If stone is wanted for aggregate, additional charge of $1.00 per cu. yd. is made to above prices. 5% cash discount for payment 10th of month following date of invoice.

MONTGOMERY, ALA.—Prices per cu. yd. delivered in city limits. (g)

Mix		Mix	
1–2 –4	6.60	1–3–6	5.95
1–2½–5	6.20	1–2 mortar topping	11.50

(g) Discount of 25c per cu. yd. for payment in 30 days. Special quotations for quanti*y orders.

NEW ORLEANS, LA. (h)—Plant prices per cu. yd. for 1 to 50 yd.

Mix	Cement Portland	Cement "Incor"	Mix	Cement Portland	Cement "Incor"
1–4 –8	5.65	6.50	1–2 –3	7.45	9.45
1–3 –6	6.10	7.25	2–3 –6	8.30	10.60
1–3 –5	6.40	7.70	1–1½ topping	10.55	14.95
1–2½–5	6.65	8.10	1–2 topping	9.45	13.15
1–2½–4	6.80	8.35	1–3 topping	7.85	10.55
1–2 –4	7.05	8.75			

Plant prices per cu. yd., 50 cu. yd. and over

1–4 –8	4.75	5.55	1–2 –3	6.15	8.00
1–3 –6	5.10	6.15	2–3 –6	6.90	9.05
1–3 –5	5.30	6.50	1–1½ topping	8.55	12.70
1–2½–5	5.50	6.85	1–2 topping	7.65	11.10
1–2½–4	5.60	7.10	1–3 topping	6.30	8.85
1–2 –4	5.80	7.45			

(h) All prices subject to 5% discount 15 days, 30 days net. Haulage based on various zones.

NEWARK AND HARRISON, N. J.§

1–2 –4	6.50	1–3– 6	6.25
1–3 –5	6.00	1–2½–5	6.50

§Discount of 2% if paid by 10th of month following delivery.

NEW YORK CITY, N. Y.‡—Prices per cu. yd.

Manhattan and Bronx Mix		Queens Mix	
1–1½–3	9.50	1–1½–3	8.50
1–2 –4	8.50	1–2 –4	8.00
1–2½–5	8.25	1–2½–5	7.75
1–3 –6	7.75	1–3– 6	7.50

Westchester County (within radius of 7 miles)

1–1½–3	9.25	1–2½–5	8.00
1–2 –4	8.50	1–3 –6	7.50

Brooklyn

Mix	Under 50 cu. yd.	Over 50 cu. yd.	Mix	Under 50 cu. yd.	Over 50 cu. yd.
1–1½–3	9.50	8.50	1–2½–5	9.00	7.75
1–2 –4	9.25	8.00	1–3 –6	8.75	7.50

‡Special designed mixes on the strength basis priced according to the strength desired.

OMAHA, NEB.*—Prices per cu. yd. for quantities from 1 to 300 yd., delivered anywhere within the city.

28-day strength		28-day strength	
No. 1. 3500 lb. sq. in.	6.75	No. 3. 2500 lb. sq. in.	6.25
No. 2. 3000 lb. sq. in.	6.50	No. 4. 2000 lb. sq. in.	6.00

Transit-Mix Concrete

28-day strength		28-day strength	
No. 1. 3600 lb. sq. in.	6.90	No. 3. 2600 lb. sq. in.	6.40
No. 2. 3100 lb. sq. in.	6.65	No. 4. 2100 lb. sq. in.	6.15

*Sand-gravel mix used as aggregate. No. 1, 6 sacks cement per cu. yd. concrete; No. 2, 5½ sacks cement; No. 3, 5 sacks cement; No. 4, 4½ sacks cement. For high-early-strength concrete using "Quikard" or other supercement. add $2.50 per cu. yd.

PITTSBURGH, PENN.—Prices for ready-mixed concrete. Prices shown are per cu. yd. delivered, up to 50 cu. yd. On over 50 cu. yd., reduction of $1.00 per cu. yd. (j)

Mix	Strength		Mix	Strength	
1–1½–2½	4000 lb.	7.45	1–2½–4½	2500 lb.	6.60
1–2 –3	3500 lb.	7.10	1–2½–5	2500 lb.	6.45
Class A	3500 lb.	6.95	1–3 –5	2000 lb.	6.35
1–2½–3½	3000 lb.	6.85	1–3 –6	1500 lb.	6.25
1–2 –4 (Class B)	3000 lb.	6.75			

(j) Class A concrete is a special concrete prepared for the city of Pittsburgh. Prices vary according to zones. Dealer's commission of 50c per cu. yd. allowed in all zones with exception of Yellow Zone. No commission allowed over 200 cu. yd. Prices subject to cash discount of 25c per cu. yd. for payment 15 days from date of invoice.

SAN ANTONIO, TEX.—Prices per cu. yd. in first (1-mile) zone.‡

Mix		Mix	
1–1½–3	6.90	1–2½–5	6.00
1–2 –4	6.30	1–3 –5	5.80
1–2½–4½	6.20	1–3 –6	5.70
		1–4 –8	5.30

‡For deliveries outside of first zone (1 mile) add 25c per cu. yd. each mile. Discount of 50c, 10 days.

Recent Prices Bid and Contracts Awarded

Middletown, Penn. The Union Quarries Co., near Hummelstown, was low bidder on county requirements for stone for macadam road construction. Its bid was $1.77 per ton for 1690 tons of ballast, 680 tons of stone screenings and 120 tons of stone chips.

Appleton, Wis. The county did not let contracts when bids for crushed stone were recently opened. Bids ranged from $1.18 to $1.55 per cu. yd.

Portland, Ore. Star Sand Co. was recently low bidder on 1400 cu. yd. of rock for revetment work on the Columbia river. It bid $1.29 per yd.

Columbus, Ohio. The Jackson Sand and Gravel Co. was recently awarded contract for 1875 tons of sand and gravel at 60 c. per ton for use at the city light plant.

Macon, Ga. The Bibb county board of commissioners met in special session August 13 to open bids for the coming year's cement requirements. The bid of eight dealers was identical at $2.32 per bbl. for a minimum requirement of 15,000 bbl. The board said it would divide the business equally among the dealers.

Seattle, Wash. The General Construction Co. was low bidder for 300 cu. yd. of quarry rock at $2.45 per yd. at a recent letting by the city.

New Rockford, N. D. Charles Allmaras was the successful bidder for graveling 1½ mi. of road in Hillsdale township. His bid was 30 c. per cu. yd.

Cherokee, Ia. A contract for resurfacing approximately 22 mi. of gravel roads in Cherokee county was awarded C. A. Emory Construction Co. of Coon Rapids by the board of supervisors early in August. The bid of $9450.40 covers cost of 17,300 cu. yd. of gravel, 256,000 additional one-half units of haul and 2300 cu. yd. of stripping pit.

Home Loan Bank Board Meets Difficulties

WHILE the board of the Home Loan Banks, appointed by President Hoover soon after the bill authorizing them became law, has been actively working to start these banks to functioning, difficulties have been encountered that have retarded their work.

At present location of the district banks is the most troublesome problem. The bill authorizes from 8 to 12 of these districts. Definite data on the needs of the various sections of the country is important to make an intelligent division. And such data seem extremely limited. The number of institutions and their ability to subscribe to the stock of the district banks must be determined. The laws of a number of states prohibit those institutions, whose support the legislation won, from subscribing to stock of the banks as required by the act. This may require special legislation by such states to enable these organizations to participate. Legal opinion on the interpretation on certain sections of the bill must also be obtained. All of which tends to postpone the time when the beneficial effects of the law may be realized.

Diligent effort is being made to iron out all of the difficulties that have been encountered. Demand for funds by borrowers is being made. But just how soon funds will become actually available to the home owner from this source is still impossible to predict. Nevertheless, certain benefits should result promptly, as those with money which would normally be used for home loans should put their money back to work again, knowing that when this new reservoir is opened opportunities to reinvest their money at present attractive rates may not be easy to find.

New Awards Reflect Effect of Relief Legislation

AN ALMOST INSTANTANEOUS RESULT in the form of awards of construction projects is apparent from reports coming from all parts of the United States since the passage of the Emergency Relief legislation.

Alabama has awarded contract for 500,000 bbl. of cement for highway work. Iowa has called for bids on 1,000,000 bbl. of cement for its 1932-33 road program. Minnesota has opened bids on 38 road jobs to start work September 1, one of the largest programs to be carried out in the history of the highway department. Tennessee will award contracts in September for additional links in its road system. The highway departments of Arkansas and Mississippi have planned additional mileage with the Federal Aid money expected. Louisiana has made financial arrangements to complete all present projects under way. On August 31, South Carolina will let contracts for $2,500,000 in highway projects.

Certainly the effect of this activity on the rock products industry should be a maintenance of activity well into the winter. While maintaining activity it should also be beneficial from a profit standpoint, for there are indications that a price structure is becoming established that should eliminate unprofitable operation, at least for the lower-cost producing plants.

Sand-Lime Producer Seeks to Dissolve Company

A PETITION seeking the dissolution of the Jackson Brick Co., Jackson, Mich., was filed at the county building on August 12. Circuit Judge Benjamin Williams signed an order to show cause which is to be heard September 20. Berry N. Beaman was appointed temporary receiver for the organization, under a bond of $5000, and authorized to carry on the business.

Organized on April 17, 1924, the Jackson Brick Co. manufactured and sold sand-lime products, specializing in sand-lime bricks. It had an authorized capital stock of $75,000, of which $70,000 was paid in, according to information contained in the petition.

At a special meeting of the board of directors on July 30 last, it was adjudged by the majority of the directors that the business was being conducted at a loss and it would be for the best interest of all concerned if the organization was dissolved, the petition states.—*Jackson* (Mich.) *Citizen.*

Sales Tax Passes in Pennsylvania—Saves Gasoline Tax Diversion

THE Pennsylvania legislature has passed the 1% sales tax, imposed for six months on the gross business of all merchants dispensing tangible personal property except agricultural products sold directly by farmers.

The $12,000,000 to be provided for relief of the unemployed will be administered by a state board, including the governor, lieutenant governor, speaker of the house, state treasurer, and auditor general.

The relief money will be disbursed among counties on the ratio of their unemployment to normal employment determined by the State Labor Department. A sum of $2,000,000 will be distributed each month starting September 1 until March, when the 1933 legislature is expected to continue providing relief if necessary then.

The fight in the state legislature to prevent gasoline tax diversion is described elsewhere in this issue.

Reorganization of Asbestos Corp., Ltd., to Be Made Soon

DIRECTORS of Asbestos Corp., Ltd., Montreal, Quebec, will meet soon to effect the final formalities incidental to the reorganization plan, and it is announced that new scrip will be forwarded to security holders in exchange for that already deposited as soon as possible after the meeting.

Bondholders already have officially approved the plan, which includes the substitution of new income bonds for the present first and refunding bond issue. Common shareholders are to receive one and one-quarter shares of capital stock for each 50 shares of present common stock.

Further deposits in favor of the scheme have been made subsequent to the various security holders' meetings, and at the present time, it is said, deposits of all securities average about 85% of the total outstanding. —*New York* (N. Y.) *Times.*

Potash in 1931

DATA on potash in 1931 has been published by the Bureau of Mines. Statistics on production, sales, imports, exports and prices are included in the publication.

California City Lets Large Contract for Cement

CONTRACTS for $777,660 worth of cement for use in construction of the Pasadena Calif., water storage dam in San Gabriel canyon were awarded August 9 by the board of city directors.

Four concerns submitted a joint bid to supply 471,000 bbl. of cement. These are the California Portland Cement Co., Monolith Portland Cement Co., Riverside Cement Co., and Southwestern Portland Cement Co. [This is an average price of $1.65 per bbl.—Editor.]

Excavations at the dam site, located four miles north of Azusa, are asserted to be progressing so rapidly that pouring of concrete is expected to start within a month. More than 300 men, the majority from this city, are employed on the project, which will entail expenditure of about $10,000,000.—*Los Angeles* (Calif.) *Times.*

Ready-Mixed Concrete Barge Sinks

LOADED with five carloads of cement and equipment valued at $100,000, the floating concrete mixing plant of the Crosby Lighterage Co., Seattle, Wash., being used in reconstruction of the University bridge approaches, filled with water on August 6 and sank in 12 ft. of water. A steel hoisting tower on it toppled and splintered the barge. [This barge and the ready-mixing operations of the Crosby company were described in Rock Products, September 12, 1931.—The Editor.]—*Seattle* (Wash.) *Journal of Commerce.*

Builds New Sand Plant in California

A SAND PLANT is being built on property owned by the Southern Pacific Co., near Antioch, Calif., for the Kaiser Paving Co. of San Francisco.

A spur for taking out the sand is being built by the Southern Pacific railway.

A power line has been built to the property by the Pacific Gas and Electric Co.

This is a new location for sand excavation. Sand at this point is known as "asphalt sand" and it is said to be suited for asphalt pavement filler.—*Antioch* (Calif.) *Ledger.*

Develops Gravel Pit as Bathing Beach

THE chief amusement in Tecumseh, Mich., has centered about the Puritan Sand and Gravel pit. It boasts the best beach and the cleanest water in the county and attracts many swimmers. Improvements have been added from time to time. There are two diving boards, a 20-ft. diving tower, and a toboggan. Also a life guard has been provided by Frank Sutton, manager of the company.—*Adrian* (Mich.) *Telegram.*

Wisconsin Mineral Aggregate Producers Form New Association

ORGANIZATION of the sand, gravel and crushed stone producers of Wisconsin was completed August 19, at a meeting held in the Lorain Hotel, Madison, Wis., with the election of officers and directors. The new organization is incorporated under the name Wisconsin Materials Association, and will maintain its head office at Madison. The purpose of the association is to promote the best interests of the industry and also to maintain a credit information office and disseminate general information regarding the uses of sand, gravel and crushed stone, for the betterment of construction work such as foundations, bridges, highways, buildings, etc., using these products or their allied lines.

Gordon F. Daggett

Officers elected were, A. A. Laun, of the Elkhart-Moraine Sand and Gravel Co., president; George Brew, of the Waukesha Washed Sand and Gravel Co., vice-president; Richard W. Lutz, of the Lutz Co., Oshkosh, secretary-treasurer. Messrs. Laun and Brew, together with Mrs. M. O. Gillen, of the Waukesha Lime and Stone Co., Waukesha; Louis H. Ebbe, of Rasmussen and Ebbe Sand and Gravel Co., Waupaca, and A. O. Ayres, of the Eau Claire Sand and Gravel Co., Eau Claire, constitute the board of directors.

Gordon F. Daggett, civil engineer, of Milwaukee, Wis., was elected executive secretary and materials engineer and will be in charge of the general activities of the new association. Mr. Daggett was formerly materials engineer of the Wisconsin Highway Commission and later executive secretary of the Wisconsin Mineral Aggregate Association.

A constructive working program for the new association is being worked out and by cooperation with the railroads, State Highway Commission of Wisconsin, city engineers and others having to do with the industry it is hoped that much good may result from the activities of the association. The executive secretary is a graduate civil engineer and will carry on an intensive testing service for all members and others desiring such service in the aggregate field.

In Wisconsin there are approximately 60 commercial producing plants in this industry, covering the entire state, and therefore the activities of the new organization will be far-reaching.

Western Lime Builds Hydrating Plant at Green Bay

STRUCTURAL STEEL was expected on August 10 at the Green Bay, Wis., plant of the Western Lime and Cement Co., to be used in its new lime hydrating unit. The basement of the building, 20 by 68 ft., is completed. The new unit is being constructed at an approximate cost of $20,000.

Hydrate of lime has not been produced by the Green Bay plant heretofore.—*Green Bay* (Wis.) *Press-Gazette.*

Strike of General Material Co. Truck Drivers Settled

SETTLEMENT of the strike of union employes of the General Material Co., St. Louis, Mo., in regard to a dispute over payment for overtime, was made recently. About half of the men, including chauffeurs, engineers and laborers, went back to work and the rest will resume their jobs as work is available. Operations on about 52 building and paving contracts have been suspended temporarily because of the strike.

The same wage scale of 60 to 65c. an hr. and extra pay for overtime will be continued. Several nonunion firms also discontinued deliveries during the strike. On June 10 Ben Dody and his son, Clarence, were shot to death by an unidentified assailant while working in the place of union men. Frequent dumping of trucks, with loss of materials, was also resorted to by men who warned nonunion drivers against making deliveries.

Drivers for the Hunkins-Willis Lime and Cement Co. have affiliated with Local 600 and the firm is now recognized as a union plant.—*St. Louis* (Mo.) *Globe-Democrat.*

J. H. Dalbey Sales Manager

THE Cumberland Portland Cement Co., Cowan, Tenn., announces appointment of J. H. Dalbey as sales manager of the company. Mr. Dalbey will be assisted in handling sales of Cumberland cement by Frank Beasley and Sam C. Gates, representatives

Proper Selection of Wire Rope

THE PROPER SELECTION of wire rope and accurate records of its service make possible important savings in the wire rope bill, according to A. S. Rairden, chief engineer, American Cable Co., New York City, in a recent article published in *Engineering News-Record*.

Proper selection means of course choosing rope of the proper construction for the particular use. The most important factors entering into the choice are: (a) the stress or load on the rope; (b) resistance to bending fatigue; (c) resistance to abrasion, and (d) resistance to distortion or crushing.

Stress—The tension in the rope includes the static load, the added tension due to acceleration and the tension due to friction. Also there should be taken into consideration the fact that in bending around sheaves of normal size a wire rope loses about 5% of its strength because of bending stresses set up in the wires. The total tension should be multiplied by a factor of safety of not less than six to obtain the required breaking strength.

Bending Fatigue—The resistance to bending fatigue is inversely proportional to the tensile strength of the wire and to the size of the outer wires in each strand.

Abrasion—Resistance to wear is directly proportional to the tensile strength and to the size of the outer wires in each strand. The relative resistance to wear of various kinds of wire rope is shown in the accompanying table.

Crushing Strength—Resistance to distortion or crushing is inversely proportional to the number of strands in the rope and the number of wires per strand. An 8-strand rope will distort much more readily than one of 6 strands. The more wires in a strand the more tendency to slide by one another and produce distortion and uneven load distribution. Flexible ropes such as 6x33 and 6x37 should preferably not be overwound on a drum.

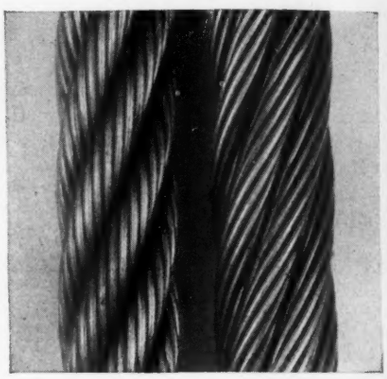
Wire Rope Types

In the manufacture of wire rope the individual wires are twisted into strands and these strands are then twisted around a core of hemp or a small independent wire rope, all this being done in machines which are constructed so as to minimize as much as possible the torsional untwisting forces in the wires.

A recent improvement consists in preforming or preshaping the wires and strands by passing them over rollers so that they assume the helical shape they will have in the finished rope. This removes practically all the untwisting effect so that when such ropes are cut the ends remain in their normal positions and do not fly apart. Such preforming is designed to lengthen the life of the rope.

Wire rope is made in two types: regular-lay and lang-lay, as shown in the accompanying illustration. In *regular-lay* rope the twist of the wires in the strand is opposite to that of the strands in the rope and the outer wires of the strands are parallel to the axis of the rope. In *lang-lay* rope the direction of twist, or lay, is the same for both the wires and the strands and the outer wires of the strands are at an angle of about 37 deg. with the axis of the rope. The length of the outer exposed wires on the crowns of the strands is about one-third as great for the regular-lay rope as for the lang-lay rope.

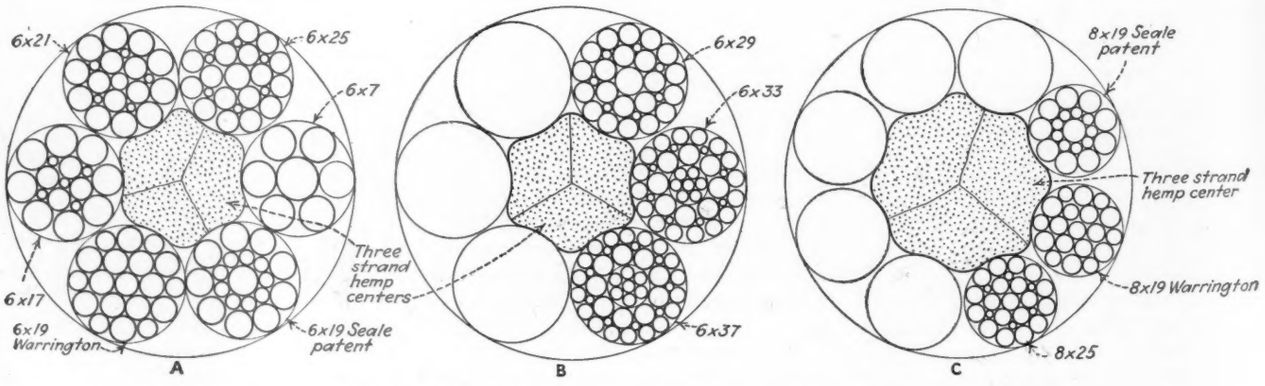
When regular-lay rope is bent over a sheave the bending stress is directly along the axis of the outer wire, whereas in the lang-lay rope the stress in the wire is at an



Showing difference in construction between regular-lay and lang-lay wire ropes; regular-lay at left and lang-lay at right

COMPARISON OF WIRE ROPES
(In order of resistance to wear)

Construction	Common applications
6x7 (most resistant to wear)	Cable drilling rigs.
6x7 lang-lay	Haulage systems with large sheaves and drums.
6x17 filler wire regular-lay and lang-lay	Haulage systems; mine inclines.
6x19 Seale regular-lay	Timbering operations; mine inclines.
6x19 Seale lang-lay	Haulage systems; mine inclines.
6x21 filler wire, regular-lay	Haulage systems; mine hoists.
6x21 filler wire, lang-lay	Haulage systems; mine inclines.
6x19 filler wire, regular-lay	General utility hoists; derricks, clamshell buckets.
6x19 filler wire, lang-lay	Mine hoists; shovels.
6x19 Warrington regular-lay	Mine hoists; elevators; cable drilling.
8x19 Seale regular-lay	Hoists; elevators.
6x29 filler wire, regular-lay	Hoists; mill cranes; clamshell buckets.
6x29 filler wire, lang-lay	Mine hoists; shovels.
8x19 filler wire, regular-lay	Light-duty hoists; elevators.
8x19 Warrington regular-lay	Light-duty hoists; elevators.
6x33 regular-lay	Mill hoists.
6x33 lang-lay	Shovels.
6x37 regular-lay	Mill hoists.
6x37 lang-lay (least resistant to wear)	Shovels.



Typical six- and eght-strand wire ropes with strands of various construction

angle of 37 deg., which decreases its magnitude slightly. Also, as the reaction in the lang-lay rope is over an exposed length three times that of the regular-lay rope, the fibre stress is less, giving longer life.

In the past a lang-lay rope has not been regarded with much favor because of its pent-up torsional stresses. The rope kinked easily and was hard to handle during installation. This is now overcome by the preforming process, which causes the rope to lie straight at all times, with no tendency to kink or loop, and has made their installation just as easy as regular-lay ropes.

However, lang-lay rope has two disadvantages. It does not resist crushing as well as regular-lay rope and should not be used where the rope overwinds more than two layers on the drum or where winding is not uniform and even. Also, it has a greater tendency to untwist than regular-lay rope and should only be used where both ends are permanently fixed.

Annual Road Show Exhibits at Detroit

A JOINT MEETING of more than ten national organizations representing every phase of highway and building activities will be incorporated in the Highway and Building Congress to be held in Detroit during the week of January 16, 1933, as noted in ROCK PRODUCTS, August 13. It is estimated that this gathering will attract 40,000 people, consisting of highway officials and engineers, contractors, manufacturers, architects, bonding companies, bankers and civic organizations, from all sections of the United States and many foreign countries.

The purpose of the congress is to devise a coordinated program of future activities that will lead to the immediate improvement in national economic affairs as related to highways and building and, in addition, will prevent a repetition of conditions which have existed for the past three years.

The organizations participating in the congress are: Construction League of the United States, American Road Builders' Association, Associated General Contractors of America, Truck Association Executives of America, the Asphalt Institute, National Crushed Stone Association, National Paving Brick Association, National Ready Mixed Concrete Association, National Sand and Gravel Association, and the Portland Cement Association.

Simultaneously with the Highway and Building Congress an exhibition of highway and building materials and equipment will be held at the Detroit municipal airport. The exhibits will cover the entire floor area of the gigantic airport hangar and will include all types of materials and equipment used in building and highway work. During the past year many new products have been developed in connection with highways. These new machines and devices will be on display for the benefit of those interested in the economical and efficient conduct of highway programs. The exhibition will afford an opportunity for the personal inspection of equipment and materials with regard to their workmanship, stability, adaptability, economy of operation, and saving in road and building construction and maintenance.

One of the oustanding results of the congress is expected to be the development of a program of education designed to acquaint the public with the contribution of the construction industry to sustained national equilibrium. It will define the place of highway and other forms of construction in respect to improved transportation, industry, agriculture, education, and all other phases of national life.

Monday, Tuesday and Wednesday, January 16, 17 and 18, the individual participating organizations will hold their regular convention programs separately. Thursday a combined program will feature the highway program—its strategic position in the progress of the nation, its relation to the economic and social life of every individual, its vital importance to education and industry, its benefits to agriculture, its significance in our transportation system, and its relation to the taxpayer.

Friday will be devoted to a program on building. Problems of the building industry for the future will be discussed, as well as the many problems confronting the industry in connection with the relief act which was recently passed by Congress and which is now in the hands of the Reconstruction Finance Corp. This meeting will be of particular interest to architects, contractors, bonding companies, bankers, and material interests.

The speakers for the programs will be selected from the best known and most outstanding authorities in the country. The subjects to be covered are those of vital interest to every citizen, and the addresses will be so prepared that they will be read by everyone. In this manner the Highway and Building Congress will attract not only those particularly interested in the construction industry but those who believe in a sound prosperity for the future.

Engineering Advisory Board for Reconstruction Finance Corporation

ORGANIZATION of its program for the advancement of loans for self-liquidating construction projects, for which $1,500,000,000 is available under the provisions of the Emergency Relief and Construction Act of 1932, was begun, August 11, by the Reconstruction Finance Corporation, with announcement of the appointment of an Engineers' Advisory Board to submit recommendations on the merits of all such projects.

Procedure for handling the "large number" of applications for such loans was discussed at an initial meeting of the newly appointed board, which is to have its headquarters in the Corporation building, Washington, D. C., it was announced.

Under Title II of the act, which enlarges the scope of the loan operations of the corporation and increases its borrowing power, financial assistance for self-liquidating projects is authorized for public works authorized under Federal, state or municipal law; housing and reconstruction of slum areas; bridges, tunnels, docks, viaducts, waterworks, canals and markets, devoted to public use, and forest and natural resource projects which are publicly regulated.

A project is defined as self-liquidating, the act states, "if such project will be made self-supporting and financially solvent and if the construction costs thereof will be returned within a reasonable period by means of tolls, fees, rents or other charges, or by such other means (other than taxation) as may be prescribed by the statutes which provide for the project."

Loans to political subdivisions for public works projects under the act "shall be fully and adequately secured," and the corporation "may take over and provide for the administration and liquidation of any collateral accepted by it as security for such loans.

Loans made by the corporation for self-liquidating projects, the act stipulates, may be made for periods not exceding 10 years, with certain exceptions, and may be granted at any time prior to January 23, 1934.

The chairman of the board is Dr. Charles David Marx of California. Other members of the board are John F. Coleman, New Orleans; John Lyle Harrington, Kansas City; John Herbert Gregory, Baltimore, and Maj. Gen. Lytle Brown, Chief of Engineers, U. S. A.

The Engineers' Advisory Board was chosen with the cooperation of the American Engineering Council. Membership of the board was chosen to give the different sections of the country representation by engineers who occupy a distinguished position in the various branches of their profession.

Denies Permit to Build Rock-Crushing Plant

THE petition of the Yonkers Rental Corp., Yonkers, N. Y., of which Anthony Cianciulli is president, to erect a stone-crushing plant and establish a quarry on a 19-acre plot on Tarrytown road, was denied by the Zoning Board of Appeals August 16.

The appeal was taken after the building inspector denied permission for the plant because the zoning ordinance limits the section on Tarrytown road to business and not industrial uses.

The project called for a capital expenditure estimated at $50,000. The Yonkers Rental Corp., which is engaged in the contracting and building business, planned to quarry the stone for its own use, and also to sell it.—*Yonkers* (N. Y.) *Herald.*

New Machinery and Equipment

Sand Washer and Dewaterer

By John J. Zollinger
Oakhurst, N. J.

NOTWITHSTANDING depressions, hard times and common ills, the march of progress must go on. Business methods change continually, in some lines gradually, in others rapidly. Some industries are of such long standing that through the course of evolution they have perfected the manufacturing and marketing methods to such an extent that but few improvements are possible. The sand and gravel industry, however, still offers opportunities in its every branch; in the construction of plants, improvements in machinery, sales methods, and in the education of the public in the thousand and one ways of using our products.

"Necessity," as the saying goes, "is the mother of invention," and this is true in regard to the new sand washer and dewatering machine which I am about to describe. Great efforts have been made in this field of the industry, and I am sure every producer of sand is interested in new developments along new lines.

This particular machine is being handled by the Wright Co., of South River, N. J., and this company, by the way, is doing big things in a quiet way.

The story of the evolution of this machine is quite a long one and embodies all the worries and growing pains which all of us know so well. For some years a New Jersey concern has manufactured a grade of sand which is more commonly known as Amboy sand and is mostly used in connection with asphalt pavement. The grading has to conform to the following specifications:

Plus	10-mesh	0- 2%
Plus	30-mesh	10-30%
Plus	50-mesh	15-42%
Plus	80-mesh	20-40%
Plus	200-mesh	15-35%

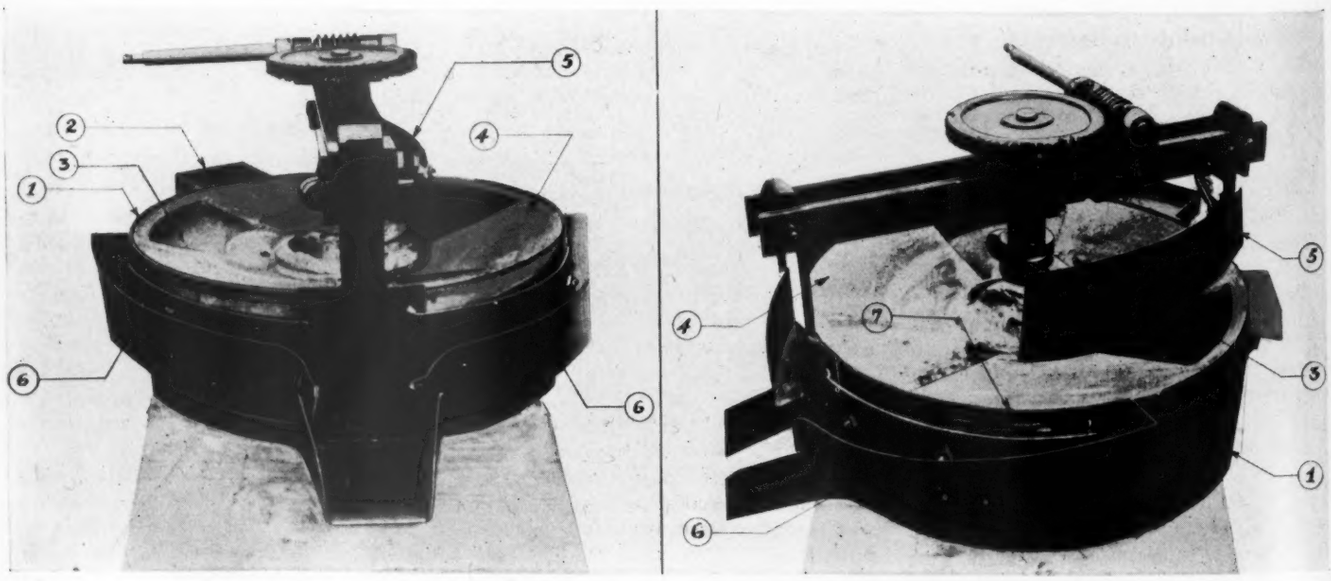
It is easily seen that to wash this type of sand is not an easy problem, particularly since the deposit in question grades 55 to 60% finer than 50-mesh. Also, nature has slightly complicated things by depositing this sand between nice layers of clay, ranging from 2 to 6 ft. in thickness. There are no fabulous prices obtainable for the product; it therefore has to be produced practically as cheap as concrete sand.

After experimenting with almost every known sand-washing device the results still remained unsatisfactory and efforts were concentrated upon new principles and entirely different methods. How well these efforts turned out is shown by the new machine, which is a mechanical washer, has an uncanny production capacity, washes the material thoroughly, and discharges the finished product with a minimum of agitation. The principle of operation is very simple; perhaps the readers are acquainted with the method of replenishing the water supply of a locomotive by means of scoops while the train is in motion. This roughly indicates the mode of operation. The photographs clearly illustrate the construction of the machine.

In the illustrations (1) comprises the main or settling tank, with the inlet at (2). The material enters at the bottom of the tank and is removed or distributed by the scoops (3). It is apparent that the entire area of the tank is used as a settling basin, since the scoops continually clear a pathway for new material. As the sand accumulates the action of the scoops raises it out of the water on to the flat portion of rotor member (4), from which it is removed by the stripper (5). Although the rotor (4) may be adjusted below the overflow level (6), any excess water discharges into the main tank over the edge of the rotor at point (7).

The machine does not ship water at any time, whether the feed is increased or decreased, or whether the machine is turned over with only water in the tank. It must be kept in mind that dewatering takes place as soon as the scoops build up sand, that is, the voids are being closed and the water displaced by compressing the sand, and as the material reaches the stripper blade the moisture content is about 20%. Additional draining takes place at this point, and as the sand is discharged it may easily be conveyed on a belt or loaded directly into scows, cars or trucks.

The stripper (5) clears the rotor (4) by approximately ¼ in., so that no wear occurs at that point, also the scoop angle is designed to slope at such a degree that

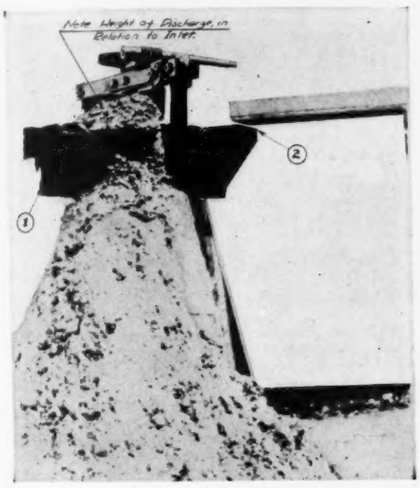


Two views of sand washer and dewaterer, showing method of operation

the material moving upward moves on its own surface, the entire wear being therefore negligible. Two strippers arranged opposite one another may be used to speed production, which of course would be accomplished at the cost of higher moisture content.

Roller bearings are used for main shaft bearings and roller thrust bearings under the large gear to take the downward thrust. The machine and drive are horizontally arranged and the discharge is on the same level with the inlet. A 6-ft. diameter machine of this type produces from 40 to 50 tons per hour with a power consumption of 3½ hp. The speed ranges from 102 to 150 ft. per min. peripheral speed, depending upon the nature of the material to be handled.

The outstanding characteristics are the



The washer installed

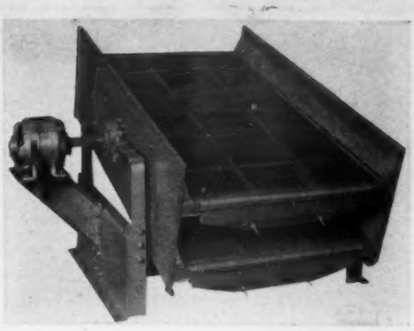
facts that the overflow extends practically over one-half of the entire circumference of the tank and that no agitation or disturbance takes place while removing the washed material. Also any material once settled may be removed without loss from washing away, since the sand is gradually elevated out of the water with a minimum of voids, and drainage takes place without affecting or washing away any material in the process of dewatering.

●

Vibrating Screen

THE "Whippet" is the name of a vibrating screen announced by the Robins Conveying Belt Co., New York, N. Y. It is designed especially for high-capacity screening of fines.

In design the "Whippet" embodies high-speed "circle throw" motion, low power consumption, running adjustment of amplitude, running adjustment of slope of screen, subdivided arching of screen surface, interchangeable pre-tensioned panels, and sealed lubrication, the manufacturer states.



Double deck, direct driven screen

The vibrator is a self-contained unit in which the ball bearings and the hardened steel race-ways for the floating eccentrics are constantly bathed in oil. The oil is sealed in.

This screen is available in single, double and triple deck, 3 ft. wide by 5 ft. long. It is furnished with a complete dust cover, if the nature of the screened material requires such protection. It may be driven by any of the conventional methods.

●

Standard Blasting Agent Made More Effective

APEX No. 1, a new rock explosive, is announced by the Atlas Powder Co., Wilmington, Del., as a substitute for the more expensive high-strength explosives heretofore used in quarrying.

Apex is a high explosive of the low density type, developed to provide an explosive of the dynamite type which, upon detonation, will create a force capable of gaining greater purchase on the burden, the manufacturer states. It is claimed to generate a force of low violence as regards shattering action, but of sufficient power to destroy the crystalline nature of rock. Ideal fragmentation, controlled throw of debris, limited backbreak, and more tons of rock per pound of powder used are secured, according to the manufacturer.

●

Welding Outfit

A NEW welding outfit known as the Oxweld automotive welding outfit has been announced by the Linde Air Products Co., New York, N. Y. Although this outfit is intended primarily for the auto repair shop, its adaptability to a wide range of work is said to make it appropriate for many other repair jobs.

●

Gasket Compound

THE General Electric Co., Schenectady, N. Y., announces a new gasket which, it is claimed, is not affected by oil at high temperature. According to the manufacturer, oil-filled assemblies have been operated on test at from 210 to 230 deg. F. for a year without effect on the gaskets and without leaks.

The compound may be used in contact with cemented joints and neither dilute acids nor dilute alkaline solutions affect the compounds, the manufacturer states. A sticker is not required for most applications, but where conditions to which the gasket is exposed are severe a pigmented varnish may be used as a cement and a protective film.

At present the material can be obtained in sheets up to 13 by 36 in., in thicknesses from 1 mil to ⅛ in. Round gaskets available at present have a maximum diameter of 12½ in. and a maximum thickness of ⅛ in.

●

Now Lubricates Wire Rope Internally

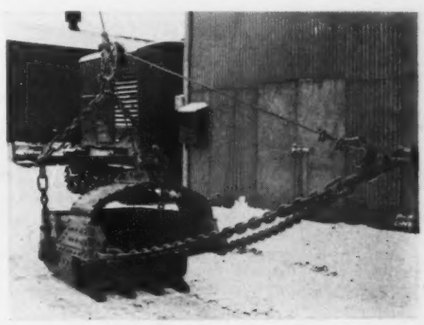
THE Macwhyte Co., Kenosha, Wis., announces it is now manufacturing "preformed" and internally lubricated wire rope. The company has been manufacturing "preformed" wire rope for several months, but the addition of internal lubrication with a special lubricant is new.

This lubricant is new in the manufacture of wire rope but has been used for some time as an outside coating for wire rope on dredges and equipment that come in contact with corrosive elements. It also has high resistance to heat, tests showing it to resist temperatures of 220 deg. F. for 312 hr. without melting, the manufacturer states. The qualities of the lubricant are now extended throughout the construction of the rope, instead of being limited to the outer surface, as results when it is applied externally only.

●

Dragline Buckets Improved

IMPROVEMENTS in its line of P&H dragline buckets are announced by the Harnischfeger Corp., Milwaukee, Wis. These improvements include welded bucket shell construction, eliminating projecting rivet heads, simple dump sheave with self-oiling bearing. The spreader bar is made



Uses welded bucket shell

of angle bars riveted into a box section with white oak filler.

Four forged renewable wearing shoes are welded to the bottom of the bucket shell to take care of wear. The cutting lip is renewable, as well as the bucket teeth points, which are also reversible.

THE INDUSTRY

Incorporations

Independent Crushed Stone Co., Omaha, Neb., $20,000. Albert E. May and Jean Thom.

Clarence Sand and Gravel Co., Buffalo, N. Y., reduced capital from $500,000 to $100,000.

Wilson Contracting Co., Inc., Wilmington, Del., $10,000. To operate sand and gravel pits.

Marion Asphalt Products Co., Marion, Ohio. M. Hunt, R. A. Hunt and F. Morris. To produce amiesite products.

Northwestern Dredging Co., Sturgeon Bay, Wis., $35,000. John H. Purves, Thomas A. Sanderson and Grover M. Stapleton.

Wisconsin Materials Association, Madison, Wis. Non-stock. A. A. Laun, Geo. Brew, L. A. Garrity and G. F. Daggett, 735 E. Briarwood Pl., Milwaukee, Wis.

Concrete Materials Corp., Cincinnati, Ohio, 3000 shares of no par value and $1000 in preferred stock. Fred Weiland, Harry P. D'Angelo and J. G. Williams. To deal in sand, gravel and building materials.

Valley Sand and Gravel Co., Davenport, Ia., $25,000. B. H. Kelley, president, and Wilfred W. Behm, secretary-treasurer. To produce sand, gravel, crushed rock and other building materials. (Previous notice of this incorporation published in our issue of July 30.)

Quarries

Warren, Ohio. A stone crusher is being installed on the Glenn Spahr farm near here.

Ottawa Stone Co., Ottawa, Ohio, recently purchsed mechanical loading equipment for its quarry.

H. E. Barthman is operating a quarry on the former C. G. Campbell farm near New Holland, Ohio.

Sherman Stone Co., Topeka, Kans., has increased operation at its Elmont quarry as the result of a number of contracts recently obtained.

Clarence, Ia. The stone quarry west of Lowden, which has not been operated for several years, is being opened and a crusher will be installed.

J. O. Strawn of Sherrodsville and **Grant Dolvin** of New Cumberland, Ohio, have leased the Mullet quarry near Dover and will produce agricultural limestone.

The Langley brothers are installing a crusher on their farm east of Admire, Kans., from which they will supply crushed stone for road work in that vicinity.

Caney, Kans. A county crew is prospecting here for quarry sites for the Jefferson road. A county rock crusher will be installed when a site has been selected.

Erie Stone Co., Huntington, Ind., has been awarded contract to supply 15,000 tons of ballast to the Wabash railroad. It is interesting to note that buying of ballast is being resumed by the railroads.

Sand and Gravel

Westfield Gravel Co., Westfield, Ind., has filed preliminary papers asking for dissolution.

C. C. Beam, Inc., which is building a new gravel plant at Sligo, Ohio, expected to have it in operation late in August.

Leo Arend, who is operating the Miller gravel pit near Paulding, Ohio, has installed equipment that he may supply washed gravel.

Seminole, Tex. A crusher has been installed at a quarry about 10 miles southeast of here. It will supply material for surfacing Highway No. 137.

The Horton gravel pit near Miles City, Mont., was reopened August 1 to supply ballast for maintenance work of the Northern Pacific railroad.

The Sangravel Co. recently had its fleet, which has been moored in the Tennessee river near Paducah, Ky., swept by fire. The loss was estimated at about $10,000.

Service Sand and Gravel Co., Newburg Heights, Ohio, recently had a steam shovel wrecked by vandals. Indications were that dynamite had been exploded in the shovel.

Hersey Gravel Co., Hersey, Mich., is reported as planning to rebuild its gravel plant which was recently destroyed by fire, as reported in ROCK PRODUCTS August 13.

Missouri River Sand and Gravel Co., Boonville, Mo., is building a new barge to have a capacity of approximately 200 tons of sand. It expected to launch its barge late in September.

Jonesville Gravel Co., Jonesville, Mich., has reopened its plant after a shutdown of more than six months. It is stated that with present orders on hand, it expects to continue operation at least six months.

Foley Bros., St. Paul contractors, who have been operating a gravel pit 24 hours a day at St. Peter, Minn., have had objection made to the use of chain-drive trucks in the delivery of its production at night.

Fountain Sand and Gravel Co., Pueblo, Colo., had the sidings at its gravel plant washed away during a recent heavy storm which flooded the streets of the city. **Pueblo Sand and Gravel Co.** had some of its pumping and other equipment carried down stream at the same time.

Cement

Southern States Portland Cement Co., Rockmart, Ga., is again operating at capacity.

Colorado Portland Cement Co. reopened its plant August 1 after a month's shut-down.

Rapid City, S. D. The South Dakota state cement plant has reopened following a 60-day suspension of operation.

Marquette Cement Manufacturing Co., Chicago, Ill., has resumed water shipment of cement from its Oglesby, Ill., plant.

Alpha Portland Cement Co. resumed operation early in August at its LaSalle, Ill., plant following a shut-down through July.

Cowell Portland Cement Co. expects to reopen its Cowell, Calif., plant September 1 after having been closed for three months.

Utah-Idaho Cement Co., Ogden, Utah, resumed operation at its plant August 22. The plant has been closed since last November.

Edison Cement Corp. resumed operation at its Orange, N. J., plant August 16, after having been shut down since July 24.

Dewey Portland Cement Co. has extended operation of its Linwood, Ia., plant another three months. It is now expected the plant will operate until December 1.

Lehigh Portland Cement Co. recently was granted exemption from paying Federal taxes on electric power requirements at its Oglesby, Ill., plant by the city council.

Universal Atlas Cement Co. resumed operation of its Northampton, Penn., plant August 16 on a 60% basis. It has also increased operation at its Buffington, Ind., and Leeds, Ala., plants.

Calaveras Cement Co. reopened its San Andreas plant early in August after having been closed for more than three months. During this time the railroad right-of-way between its quarry and mill was resurveyed.

Lone Star Cement Co., Virginia, reopened its plant August 15. It had been planned to reopen the plant September 1 but pick-up in the building trade came earlier than had been expected, it is reported.

Lime

Louisville Cement Co. has resumed operation at its Milltown lime and stone plant. The force is reported the largest employed at the plant since the summer of 1931.

Kelley Island Lime and Transport Co. has received an order for 6500 tons of limestone from the Cutler-Magner Co., Duluth, Minn., to be used for the manufacture of lime.

Forrer Lime, Cement and Coal Co., Milwaukee, Wis., has filed notice of voluntary bankruptcy, although assets are listed at more than twice its liabilities.

Auburn Chemical and Lime Co., Roseville, Calif., which started operation two years ago to supply the sugar beet industry, now finds that the demand for lime by the gold mining industry has provided it an active and unanticipated market.

Cement Products

General Material Co., St. Louis, Mo., announces it is now prepared to supply cement, sand and gravel by carload or truckload, as well as Red-D-Mix concrete.

United Concrete Pipe Corp., which recently requested a permit to operate a sand and gravel pit and stone crusher near Ventura, Calif., is awaiting action by the county board before proceeding with its plans.

Other Rock Products

Utah Rock Asphalt Co., Sunnyside, Utah, has resumed operation at its plant.

W. A. Eplin, Wallace, Idaho, has applied for a phosphate mining lease on property near Drummond, Mont.

Standard Slag Co., Youngstown, Ohio, has been operating its plant from 12 to 14 hours per day during the past two months.

Hufty Rock Asphalt Co. recently closed a lease with Tom McKay, Liberal, Mo., for land underlaid with bituminous rock. Mining operations have commenced.

Mexico City, Mex. While shipments to the United States of amorphous graphite produced in southern Sonora rose to 1,242,367 lb. in the second quarter of 1932, the principal graphite mines remained practically idle, and two of the smaller mines were operated on a scale only slightly above maintenance requirements.

Personals

N. D. Moore, president of the Pacific Coast Cement Co., and family recently attended the Olympic games and returned to Seattle on the *Emma Alexander*.

C. G. Cooley, owner and manager of the Cooley Gravel Co., Chillicothe, Mo., recently was host at a picnic for Missouri state highway men. More than 150 were present.

Walter Geist, assistant manager of the milling machinery department of Allis-Chalmers Manufacturing Co., will sail for Europe September 9. While there he will study conditions and visit the company's manufacturing and sales organization in England, France, Germany and Italy.

Julius F. Stone was recently elected president of the Case Crane and Kilbourne Jacobs Co., Columbus, Ohio, manufacturer of drag scrapers, concrete carts and miscellaneous equipment. Mr. Stone is also president of the Columbus-McKinnon Chain Corp. and the Chisholm Moore Hoist Corp., both of Tonawanda, N. Y. **H. C. Hoeflich** has been elected vice-president and sales manager. Mr. Hoeflich has been associated with the company for several years.

Obituaries

Thornton Moore Orr, 62, recently died in his quarters at the New York Athletic Club. Death was attributed to a heart attack.

John Newman, 77, former gravel dealer near Raleigh, Ind., died at Rushville recently.

Harry Randille, 56, watchman at the Osborn, Ohio, plant of the Southwestern Portland Cement Co., was found dead in a stock room recently. Indications were that he had been robbed and murdered.

Manufacturers

Babcock and Wilcox Co., New York, N. Y., announces that after September 1 all purchasing will be concentrated at its Barberton, Ohio, works.

General Refractories Co., Philadelphia, Penn., announces it is now handling "Carbex" commodities manufactured by the McLeod and Henry Co., Troy, N. Y.

W. O. Feenaughty of the Feenaughty Machinery Co., Oregon representatives for the Patterson "Gyro-Centric" rock crusher, reports two recent installations as having demonstrated highly satisfactory results.

Foote Bros. Gear and Machine Co., Chicago, Ill., announces the appointment of Urquhart Service, Denver, Colo., as representative of the IXL line of speed reducers and gears in Colorado and Wyoming. It also announces that Briggs Schaffner, Winston-Salem, N. C., has been appointed district representative for both North and South Carolina.

Trade Literature

NOTICE—Any publication mentioned under this heading will be sent free unless otherwise noted, to readers, on request to the firm issuing the publication. When writing for any of the items kindly mention ROCK PRODUCTS.

Road Rollers. Catalog gives detailed description of the new Austin "Cadet" roller. AUSTIN-WESTERN ROAD MACHINERY CO., Chicago, Ill.

Welding. "Repairing for Profit" is title of publication describing application of oxy-acetylene welding in automotive repair. LINDE AIR PRODUCTS CO., New York, N. Y.

Coal Handling Equipment. Bulletin 122 describes Gifford-Wood elevating and conveying equipment for coal handling installations. Views of a number of plants are shown. GIFFORD-WOOD CO., Hudson, N. Y.

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Plus a New and Improved Internal Lubrication

Extra Value, Longer Life--- Resulting in Lower Wire Rope Costs for the User.

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● The new Macwhyte lubricant is applied cold under pressure at the moment wires are being laid together. All spaces between wires are completely packed. Withstands heat of 220° without running off. Prevents moisture from creeping in. Saves the rope from internal rust and friction. ● It makes a good rope better.

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